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# MOTOR AGE

## GARDEN SHOW A MAGNIFICENT SPECTACLE

NEW YORK, Jan. 16—With a blinding snowstorm scurrying through every street, with a high wind forcing the powdery flakes everywhere and with streets in the vicinity of Madison Square garden filled to congestion with taxicabs and motor cars, the New York public anxiously stood for over one-half hour in a mass before the garden entrance awaiting the opening of the doors at 8 o'clock, when they would have their first opportunity of seeing the products of the A. L. A. M. for the coming season. Promptly at 8 the tastefully decorated garden was transformed into a great white amphitheater by the turning on of thousands of lights. Simultaneously with this the band in the top gallery struck up the opening air, the endless crowds came as a rushing tide up the wide aisles of the main floor and the big show for 1909 was opened. In a few minutes the crowd had overflowed the main floor spaces, the aisles that were empty 10 minutes before were black; the staircases leading to the balcony were crowded and in less than half an hour the spectators had reached the uppermost galleries, had wended their way to the accessories, motor cycles and commercial cars in the basement, had found the electric vehicles in the restaurant and reached the accessories in the concert hall. As the evening wore away the crowd increased and the amphitheater panorama was a sea of predominating black, with frequent dashes of color surrounding the cars and obscuring the accessories.

VIEW SHOWING NORTHWEST CORNER OF BUILDING

The garden decorations are in white with color lent by a series of six mural paintings on the face of the galleries over the balconies on each side. At the east end of the amphitheater opposite the entrance is an immense stucco triple arch reaching to the dome with heavy Roman pillars. The arched spaces between are filled with mirrors in the top half and in the lower the accessory exhibitors on the end gallery show through. The arch is a part of the grand scheme of the circus Maximus on which the decorations are based, the oval main aisle, 15 feet wide, being the circuit and the car balcony on each side with its double row of galleries above at the ends and one row at the sides in imitation of the old Roman tribunes. The face of the many galleries is draped in white. On the main floor and balcony car exhibit signs are simple square supports 10 feet in height, each carrying a lantern style of light with the car name on the glass. At night they are conspicuous, but not so in the daylight. The walls back of the exhibits on the main floor are burlapped with vertical white strips of wood giving a continuous panel effect. The entire roof is draped in blue with girders transverse in the center and radiating at the ends studded with electric lights. Additional illumination is lent by three immense clusters of electric lights and two rows of arc lamps. While the decoration is simple and to some cheap, it is most satisfying to others who assert that now the car is the major quantity and the decorative setting the minor one. The leading criticism is the little relief to the prevailing white, a few bold dashes of color having been considered wanting. As it is the show committee has perfected in good shape all of the details in conjunction with the show.

The decorations in the restaurant at the right of the main entrance, where the electric vehicles are, is in arbor effect, with lattice roof or ceiling, looped with tendrils and blossoms. In the concert hall above this, where a big accessory exhibit is, the same effect is carried out except that over the main aisle the lattice is heavily arched upward, almost to the semi-cylindrical, and the interwoven tendrils and red blossoms, combined with the foliage-trimmed lights, make a pleasing result.

Judged from the opening night, generally known as "paper" night, the attendance was up to the standard, in spite of the inclemency of the weather. On Sunday when the exhibits were uncovered for the benefit of the press and photographers many exhibitors brought customers in and

LOOKING TOWARD MAIN ENTRANCE OF GARDEN

until dusk the place was fairly busy. The management looks for a crush every day of the week and for a total attendance to eclipse that of any previous show.

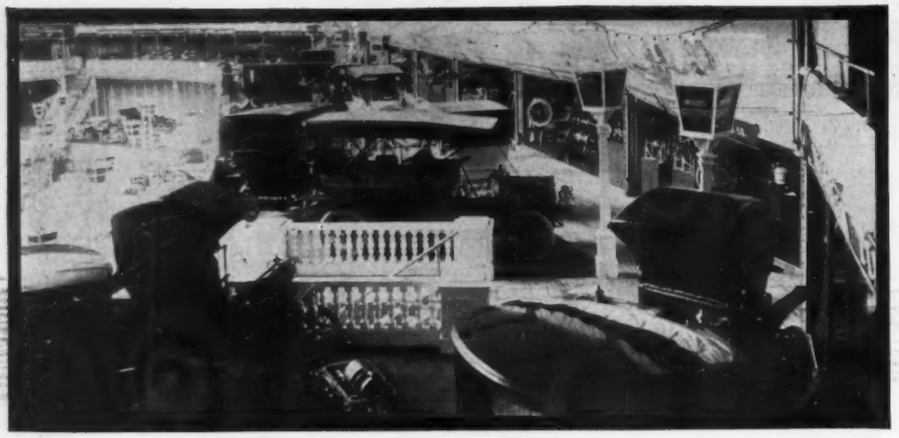
The cars have proven the magnet on the opening night and the thirty or more polished chassis have been the center of investigation. With the exception of four exhibitors, chassis are disclosed on every stand and in a few cases like the Lozier, Stearns, Matheson and Chalmers two chassis are shown. Particular attention has been given to the body work and the oft-quoted remark that the body-making end of the industry will gradually pass from the makers into the hands of the standard carriage builders seems to be some distance from realization. Many of the leading exhibitors on the main floor spaces build their own bodies entirely, although as stated by practically all of them they sell the stripped chassis if the buyer desires to secure a body at other places. What has aided the makers in holding the body trade is the flexibility in body design and coloring scheme permitted by many of the makers. Some allow every license in the finishing and equipping, retaining only the general tonneau and hood lines. With others, however, it is the stock design or nothing, and in such cases bigger sales are expected.

The small car is very much in evidence, so is the enclosed type of the landaulet, limousine or town car style, and the toy tonneau is the furore. There has not been that increasing of horsepower that was a part of almost every preceding show story; rather the limit seems to have been reached and some makers are descending on the power scale. There is only one example of where new models have been brought out that the power has been increased.

Wheelbases have been lengthened, but only to add a little extra foot room for the front-seat passengers and in order to carry the front axle forward to beneath the radiator or a little in advance of it. In medium-powered cars the wheels in many instances have been increased from 30 to 32 inches in diameter and also from 34 to 36.

The six-cylinder motor is far from the vanishing point and three or four new makers have come to the front with it, while Pierce and Winton are making it exclusively. The small six has to a large extent proven a boon to the six design, many of the little cars having very small cylinders.

Three examples of the en bloc four-cylinder motor appear; the rear axle gear-set has gained heavily; the disk clutch has



BALCONY VIEW, WOODS BOOTH IN FOREGROUND

made advances; and the casting of motor cylinders in pairs is more popular than ever before.

**Late News From Garden**

New York, N. Y., Jan. 20—Special telegram—As the week wears on the interest in the show continues and the attendance is increasing. Since Tuesday the out-of-town agents and dealers have been arriving in large numbers and the numbers of interested visitors from bordering states has increased. The majority of the makers have had all of their agencies placed for several months so that little is being done in this line. With an improvement in the weather yesterday and today the afternoon attendance increased and the evening was also up to the mark. The retail sales are, as in previous years, small; in fact the information leaked out yesterday that one big exhibitor at the show a year ago did not sell a single car, but that the out-of-town dealers brought many prospective buyers to the garden and took orders. There is not that change in exhibit spaces that was noted in previous shows, namely, makers changing models on exhibition from day to day. In nearly every case the same cars are on the floor today that were in place on opening night. The only foreign machine exhibited is the Clement-Bayard, shown in five-passenger touring and taxicab styles.

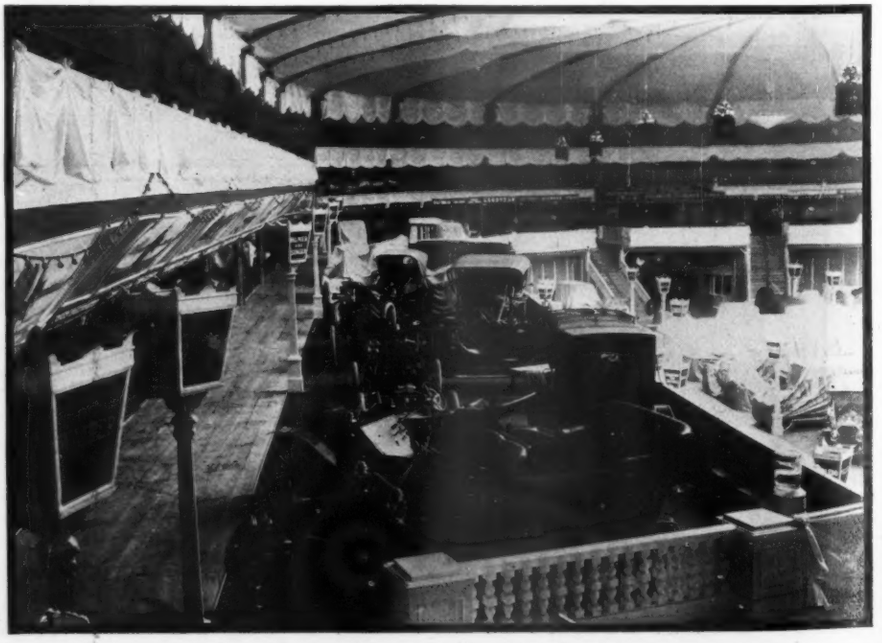
An unusual number of meetings have been held so far during the week and several others are listed for the remaining days of the show. Yesterday a session opened at 10 o'clock at the Automobile Club of America and wound up with the annual banquet. The first thing on the program was the running of a series of dynamometer tests on the club apparatus. The first car to be placed on the drums was a Fiat touring type, and the principal object of the tests was to check the accuracy of the Veeder tachometer with which the car was equipped, by means of the delicate electric recording apparatus of the dynamometer. The car was run at speeds ranging from 5 to 50 miles an hour and the readings of the tachometer closely checked with those shown by the instruments at points 5 miles apart at both increasing and diminishing speeds. The result was an unusually favorable showing for accuracy where the tachometer was concerned, its percentage of error, regardless of the speed, being so small as to constitute practically a negligible quantity. Both at the extremes of its range as well as at intermediate speeds its readings checked up with those of the dynamometer to an unusually close degree, the indications at 5 miles an hour revealing a percentage of error requiring three decimal points to express when figured in fractions of a mile per hour and its variation at the higher speeds was correspondingly small.

The Hemery Benz racer was next tried and speeded up to 65 miles per hour, when it showed in excess of 100 horsepower at the rear wheels. After these tests an adjournment was made to the Engineers' Club, where papers were read by members. A paper on the standardization of motor bearings by S. P. Wetherill, Jr., provoked particularly valuable discussion. The paper and the suggestion that it contained are largely based upon the recent successful development of die-casting under compression. Its employment results in a great saving in the cost of bearings because of eliminating handwork as well as the necessity of any machining, as the bearings are cast absolutely true to size.

S. W. Rushmore gave a resume of the paper of which he was a joint author with Herbert L. Towle, on a type of indicator with a continuously revolving drum, which was not invented with the idea in mind of perfecting a power indicator for the motor car engine, but for a specific purpose, that of locating a fault in a three-cylinder stationary engine installed in the Rushmore plant.

The makers of the engine had carried out all their tests on the first cylinder which was in perfect working order, and accordingly they were confident that their guarantee on the engine had been fulfilled. The other two cylinders were difficult of access, owing to the size and location of the engine, and Mr. Rushmore devised this special type of indicator to ascertain what was taking place in them, in which he was very successful. The indicator was then applied to a Locomobile car, and a large number of cards taken at various speeds, these cards forming part of the paper itself.

Owing to the difficulty of synchronizing the instrument with the motor, its records naturally do not form a reliable index of the power developed, but they do serve to show what is going on in the cylinder to which it is attached and are consequently of value for locating faults, such as deranged valve and ignition timing, and the simplicity of the apparatus is such that it was the inventors' idea that it could be employed by a repairman or garage attendant, as no great amount of skill was required to attach or use it, and benefit by its records, once the nature of the latter and their indications were known.



P & S AND SIMPLEX EXHIBITS IN SOUTH BALCONY

# Statistics of the A.L.A.M. Show

### Gasoline

| | |
|---|---|
| Complete Cars | 117 |
| Complete Chassis | 28 |

### Commercial

| | |
|---|---|
| Complete Cars | 19 |
| Complete Chassis | 5 |
| Taxicabs | 3 |

### Electrics

| | |
|---|---|
| Complete Cars | 37 |
| Complete Chassis | 5 |

### Bodies

| | |
|---|---|
| Seven-Passenger Touring | 20 |
| Five-Passenger Touring | 23 |
| Two-Passenger Runabout | 3 |
| Three-Passenger Runabout | 8 |
| Four-Passenger Runabout | 10 |
| Toy Tonneau | 21 |
| Limousine | 17 |
| Laudaulet | 8 |
| Town Car | 2 |
| Miscellaneous | 0 |

### Gearsets

| | |
|---|---|
| Selective Sliding | 131 |
| Progressive Sliding | 13 |
| Planetary | 1 |
| On Rear Axle | 14 |
| Unit with Crankcase | 5 |
| Separate | 12 |

### Final Drive

| | |
|---|---|
| Shaft | 122 |
| Side Chain | 22 |
| Single Chain | 1 |

### Clutches

| | |
|---|---|
| Cone | 56 |
| Multiple Disk | 56 |
| Expanding | 22 |
| Contracting | 10 |

### Motors

| | |
|---|---|
| Water Cooled | 138 |
| Air Cooled | 7 |
| Four-Cycle | 140 |
| Two-Cycle | 5 |
| Eight-Cylinder | 0 |
| Six-Cylinder | 25 |
| Four-Cylinder | 116 |
| Three-Cylinder | 3 |
| Two-Cylinder | 0 |
| One-Cylinder | 1 |
| Cylinders Cast in Pairs | 96 |
| Cylinders Cast Separately | 41 |
| Cylinders Cast en Bloc | 6 |
| Cylinders Cast in Threes | 2 |

### Ignition

| | |
|---|---|
| Jump Spark | 125 |
| Make-and-Break | 20 |
| Jump Spark Systems | |
| Double | 48 |
| Dual | 56 |
| Single | 21 |
| Magnetos, High-Tension | 75 |
| Magnetos, Low-Tension | 15 |
| Storage Battery | 79 |
| Dry Cells | 56 |

## Previous Madison Square Garden Shows

| TYPES OF CARS | Nov., 1907 | Jan., 1907 | 1906 | 1905 | 1904 |
|---|---|---|---|---|---|
| Gasoline Cars | 128 | 141 | 110 | 207 | 185 |
| Gasoline Trucks | 6 | .... | 13 | 7 | 5 |
| Gasoline Chassis | 30 | 40 | 32 | *37 | *34 |
| Electric Cars | 44 | 34 | 25 | 20 | 45 |
| Electric Trucks | 9 | 11 | 20 | 9 | 7 |
| Steam Cars | 5 | ..... | ..... | 9 | 9 |

| MOTORS | Nov., 1907 | Jan., 1907 | 1906 | 1905 | 1904 |
|---|---|---|---|---|---|
| Water-Cooled | 143 | 157 | 132 | 182 | 156 |
| Air-Cooled | 21 | 24 | 23 | 25 | 29 |
| Four-Cycle | 160 | 177 | 151 | 203 | 181 |
| Two-Cycle | 4 | 4 | 3 | 2 | 3 |
| Compound | ..... | ..... | ..... | 2 | 1 |
| Eight-Cylinder | ..... | 1 | ..... | ..... | ..... |
| Six-Cylinder | 18 | 10 | 2 | 2 | ..... |
| Four-Cylinder | 130 | 153 | 137 | 127 | 82 |
| Three-Cylinder | 2 | 2 | 1 | 7 | 6 |
| Two-Cylinder | 4 | 6 | 7 | 39 | 41 |
| One-Cylinder | 1 | 2 | 1 | 8 | 14 |
| Miscellaneous | ..... | ..... | 2 | 15 | 17 |

| IGNITION | Nov., 1907 | Jan., 1907 | 1906 | 1905 | 1904 |
|---|---|---|---|---|---|
| Jump Spark | 145 | 96 | 113 | 188 | 158 |
| Make-and-Break | 19 | 40 | 33 | 19 | 21 |
| Both | ..... | 45 | 9 | ..... | 6 |
| CURRENT SUPPLY | | | | | |
| Magneto | 31 | 19 | 39 | 31 | ..... |
| Batteries | 57 | 117 | 107 | 157 | ..... |
| Both | 49 | 45 | 9 | 19 | ..... |

* Not included in total count

# Study of the Motors in the Show.

ONE of the most astonishing features in an examination of the twenty-nine makes of gasoline cars exhibiting in the main amphitheater is the fact that there are thirty chassis shown, all of the concerns excepting Knox, Apperson, Franklin and Pope-Toledo exhibiting; and Stearns, Lozier, Matheson and Chalmers-Detroit showing two each. The Stearns booth has the new town car chassis as well as that of the four-cylinder model; in the Lozier stand are the four-cylinder and the new six; in the Matheson are the old four and the new six and the Chalmers Thirty and Forty are both exhibited. The White company shows a polished chassis of the 20-horsepower machine, this being the first time a White chassis has been exhibited at a show in America. The chassis is complete in every respect except that the condenser has been left off and it is interesting in connection with it to note that although of 20 horsepower it is a perfect duplicate of the 40-horsepower one except in the size of the parts, the 40 not containing any more.

The Packard chassis is enclosed by a satin-finished brass railing of square tubes and a large mirror forms the complete top of the dias on which the chassis stands. The Chalmers Thirty is a particularly interesting chassis in that parts of the motor, gearbox and other castings are cut away and miniature electric lights, placed in the castings, show the inner construction with great clearness. The Cadillac and Elmore chassis are similarly arranged to good advantage. The majority of the chassis are highly polished throughout, but a few have been content with the black dull finish whereas others have used white and gray enamel to good advantage instead of polishing.

The exhibition of sixes is larger than was anticipated, even their fondest devotees seeing greater progress than had been expected. The Pierce exhibit is composed entirely of six-cylinder models, embracing the three sizes, six-36, six-48 and six-60, and carrying all types of bodies from a two-seated runabout to the luxurious Louis XVI suburban finished interiorally in white and gold with furnishings to match; the Winton exhibit is entirely of sixes; the Franklin, Stevens, Thomas, Stearns, Peerless and Lozier are showing them again and in the newcomers' ranks are Matheson and Palmer & Singer. Two of the Pierce sixes, the six-48 and six-36, have cylinders cast in pairs instead of separately as heretofore done by this company; the small six Lozier has them in pairs, but with valves on one side instead of on opposite sides as in all other Lozier types; and the Thomas small six has the cylinders cast in two groups of threes instead of in pairs or separately, this being the first example of the triple-cylinder scheme in America. The Stevens six shows cylinders cast in pairs for the first time by this house and the new Matheson follows the same rule, making the entry of the company into the twin-casting field. Winton, Peerless and Stearns employ twin castings, the air-cooled Franklin uses separate castings and the Palmer & Singer has separately and twin-cast cylinders in different models.

The new Matheson six, as mentioned in these pages a week ago, has jump spark ignition in place of make-and-break employed on all other models and has a rear axle gearset and double rear hub brakes applied through long transverse equalizers working through slots in the side members of the frame. Of more than passing inter-

ONE SIDE OF THE SHOW

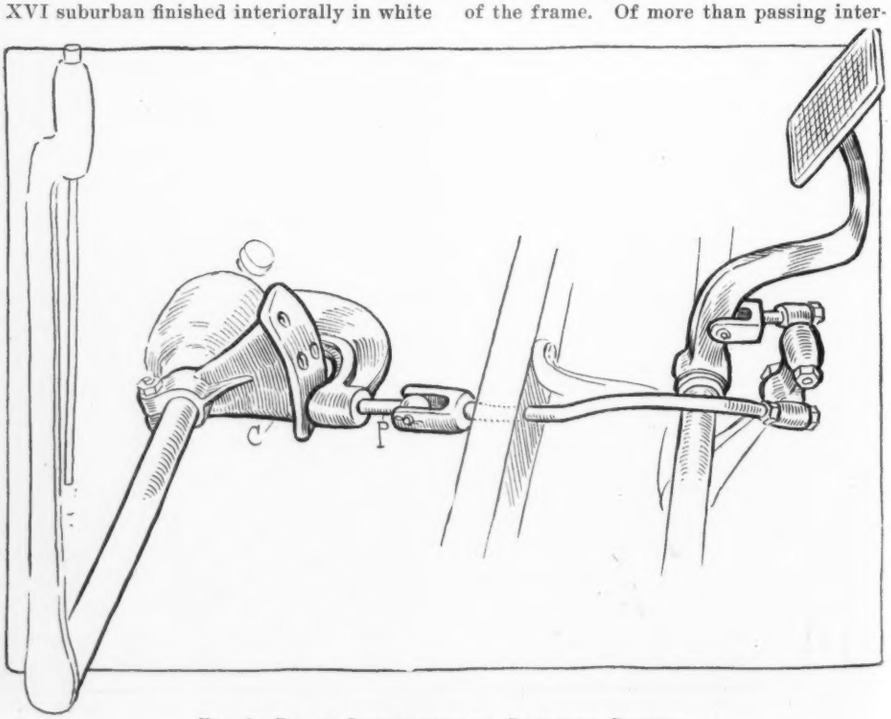



FIG. 1—PIERCE INTERLOCKER ON SELECTIVE GEARSET

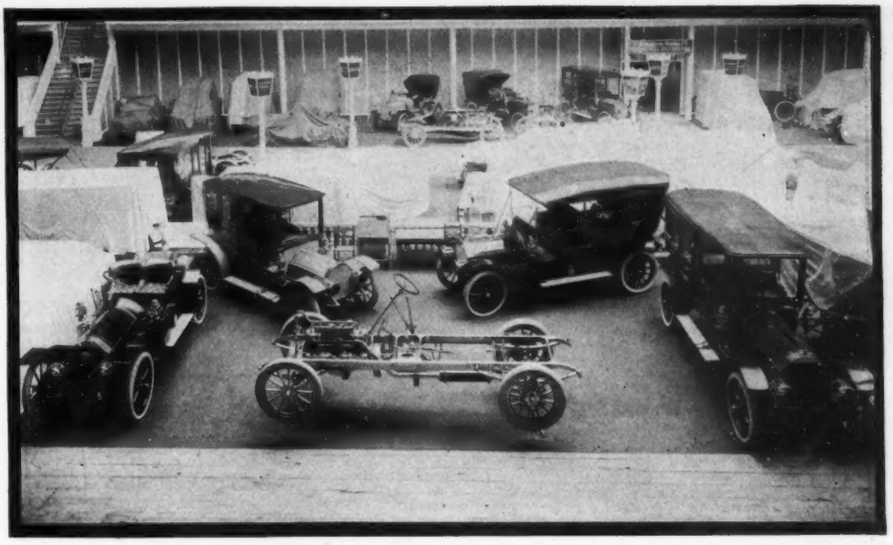
est in the small Lozier six is the supporting of the motor and gearset on a tubular subframe comprised of two longitudinal tubular pieces supported at their ends in thimbles in cross members of the frame.

Self-starters are employed only on the Winton and Royal Tourist cars, the Winton entering upon its second year and the Royal making its debut. Both are compressed air mechanisms, the air being stored in tanks on the chassis. In the Winton a distributor mechanism conducts the air to the correct cylinder. In the Royal the air pressure is generated by a vertical cylinder pump driven from the gearset by a clash gear mechanism controlled by pedal. The air-distributor is carried on the timer and connects with tubes to the combustion chambers of the four cylinders. It is operated from a lever on the dash.

Shaft-drive has made not a few inroads during the year, and now there are only two makes, namely Simplex and Pope-Toledo, shown solely with chain-drive. Locomobile shows its first shaft-driven model, Lozier has thrown all of its models in the shaft class, Stearns mixes the shaft and chain types, Thomas retains chain in large models and shaft in small six and town cars, Matheson exhibits its first shaft-drive car, it being the new six; and the Apperson line combines the shaft in a large percentage with the chain.

The *en bloc* motor with four cylinders is shown by three concerns, the Thomas cab, Stearns town car and Chalmers Thirty, the Stearns having the valves on one side and opened by direct lift and the Chalmers with intake valves in the cylinder heads and opened through rocker arms. The Thomas motor is a neat one. In the Stearns an integral web is formed between the motor arms on the right forming a bed on which the magneto rests. The Stearns incorporates the water pump in the left front motor arm and as in the Thomas and Chalmers the water piping is simplified to one intake and one return pipe.

Ignition is largely in favor of the jump spark, three makes showing the make-and-break, of which the Locomobile equips all models as in seasons past. The Matheson uses it on the four-cylinder models, but fits jump spark on the new six; and on the racer Walter car make-and-break is used, although jump spark is regular on the touring cars and town cabs. The variety of the jump spark system is told at other places in this issue.



PIERCE-ARROW EXHIBIT, FROM THE BALCONY

There are a great many new faces in the exhibit spaces, consisting of new types and models brought out by old makers who have retained their original models on an improved basis. An enumeration of them discloses the Lozier small six, Packard Eighteen, Chalmers Thirty, Stearns town car, Pierce six-36 and six-48, Matheson six, Cadillac Thirty E-M-F, Thomas little six, the Palmer & Singer line, the Apperson medium six and the Walter town cab. In contrast with these are the old faces such as Oldsmobile, Buick and Northern that are missed from their accustomed places for the first time.

Several of the makers have apparently preferred exhibiting power plants and motors to polished or painted chassis, some of the followers of this class being Peerless with a six-cylinder motor mounted on a pedestal; the two Knox power plants; the cut-away Franklin motor; the Pope-Toledo motor and gearset. Among other piece exhibits are the Locomobile radius rod design, the Chalmers group of forgings and a few examples of gearsets.

The makers have catered more than ever before to the fastidious color connoiseurs, the undoubted leader being the Pierce subtive garland effects, the upholstery from the Jaquard loom is in gray and gold urban finished exteriorally in golden green, but with the riding compartment in white and gold. The interior is finished to the minutest detail in Louis XVI style, the coloring being accurate in every respect, with cream and gold finishings. The ceiling and over-window panels carry decora-

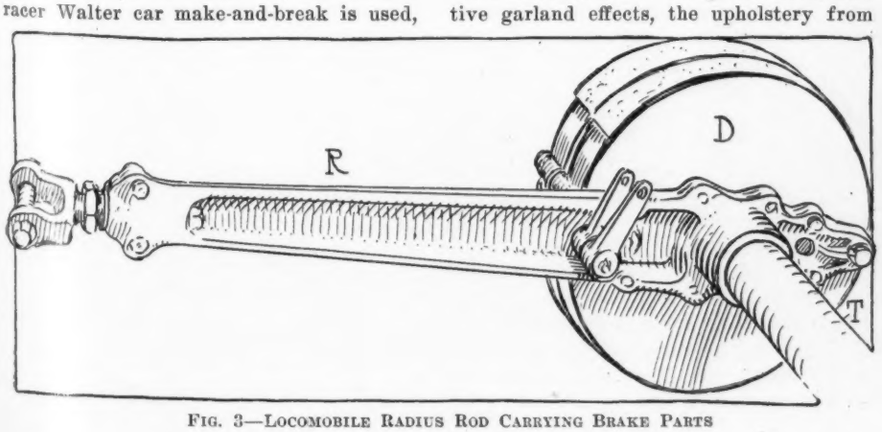
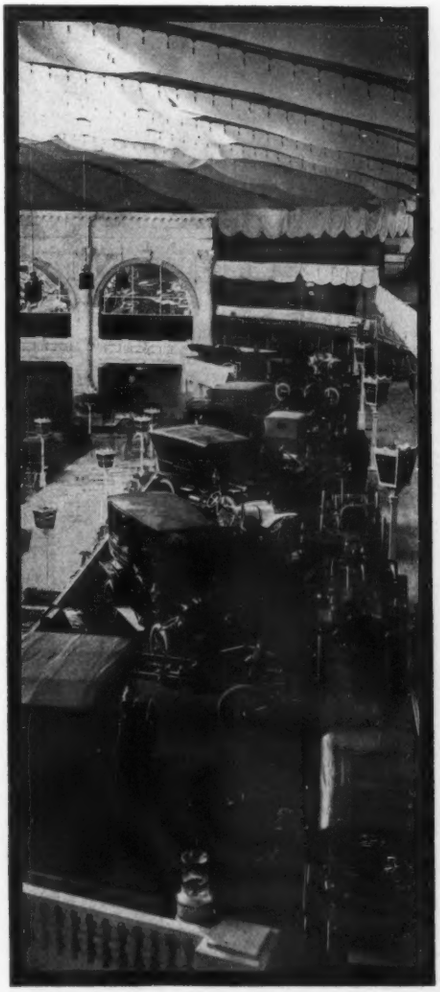
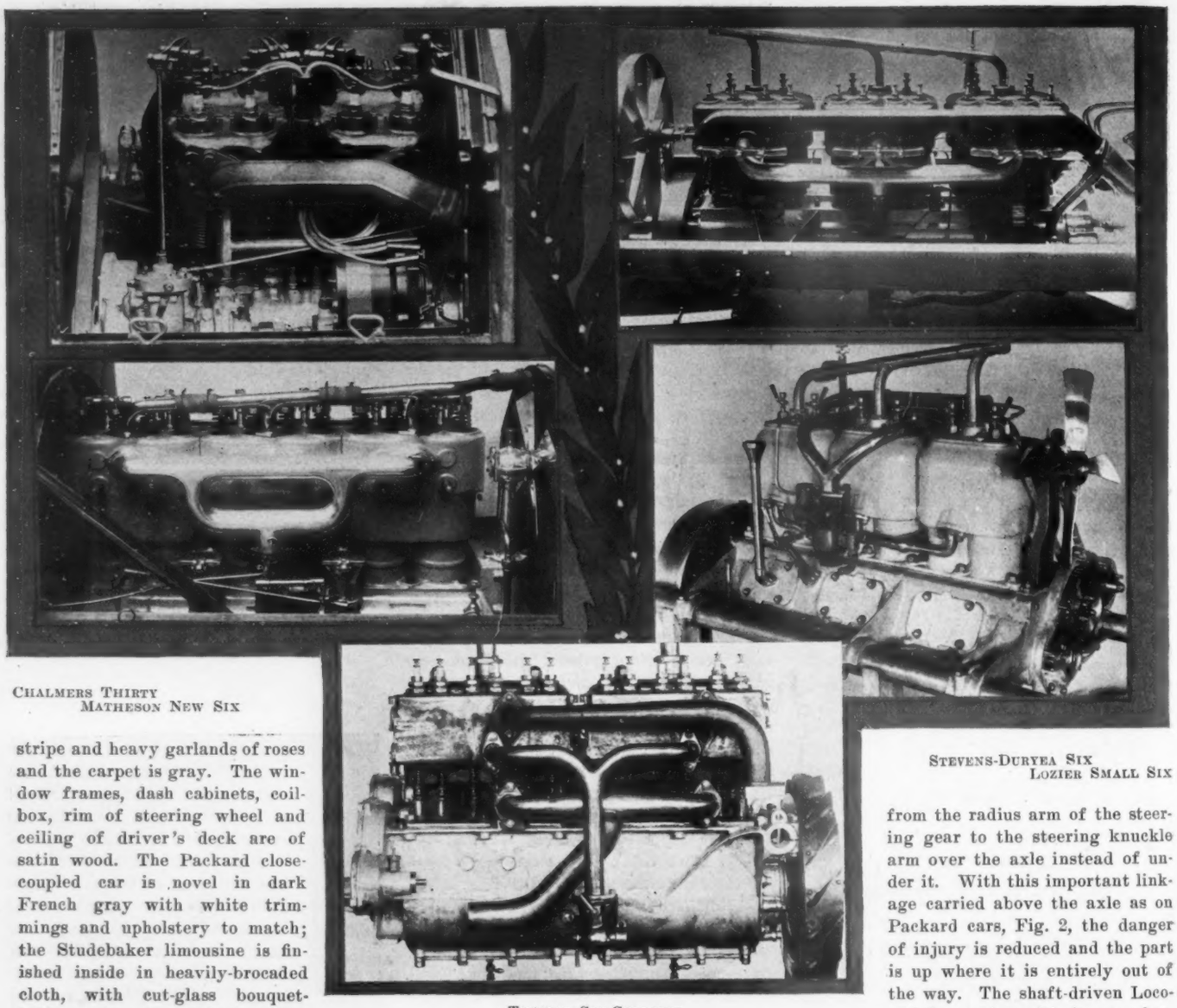



FIG. 3—LOCOMOBILE RADIUS ROD CARRYING BRAKE PARTS



LOOKING AT THE ARCHES



CHALMERS THIRTY
MATHESON NEW SIX

STEVENS-DURYEA SIX
LOZIER SMALL SIX

THOMAS SIX-CYLINDER

stripe and heavy garlands of roses and the carpet is gray. The window frames, dash cabinets, coil-box, rim of steering wheel and ceiling of driver's deck are of satin wood. The Packard close-coupled car is novel in dark French gray with white trimmings and upholstery to match; the Studebaker limousine is finished inside in heavily-brocaded cloth, with cut-glass bouquet-holder and other finishings; a Peerless roadster is in creamish white with green upholstery, matting and lamp cover; a Winton toy tonneau is in cerise with slate-colored upholstery and a four-passenger runabout is in green with black striping and black trappings and lamps; the Studebaker suburban with bird's-eye maple body has wicker seats; the Corbin toy tonneau is in fawn with tan upholstery, and the Columbia toy tonneau is in light yellow with harmonizing upholstery. In the regular cars red and black predominte, with blue in close pursuit.

Among the many details of construction might be noted the interlocking device on the Pierce selective gearset Fig. 1 in which the change speed lever sleeve carries a sector C with two series of holes in its face, each hole corresponding with one of the gear positions. Into these holes enters a pin P carried on the end of a linkage connecting with the clutch pedal so that only when a gear is properly meshed can the pin enter one of the holes and when it enters one the clutch is permitted to engage. Should a gear not be meshed, the pin will not engage and the clutch is held out.

One of the great tendencies in steering linkages is carrying the tie rod behind the front axle, all but two of the car makes having it in this position. Hand in hand with carrying the tie rod back of the axle is that of locating the end of the link from the radius arm of the steering gear to the steering knuckle arm over the axle instead of under it. With this important linkage carried above the axle as on Packard cars, Fig. 2, the danger of injury is reduced and the part is up where it is entirely out of the way. The shaft-driven Locomobile carries with it one characteristic not found on many shaft-driven cars and which Designer Riker was determined to achieve before allowing of the introduction of the shaft drive. It is a peculiar radius rod scheme, Fig. 3, in which the radius rod R rides loosely on the axle tube T and carries on it the brake carrier disk D on which are the two sets of expanding brakes.

An improvement on the Stevens-Duryea six with cylinders cast in pair is the spring tightener on the fan belt as illus-

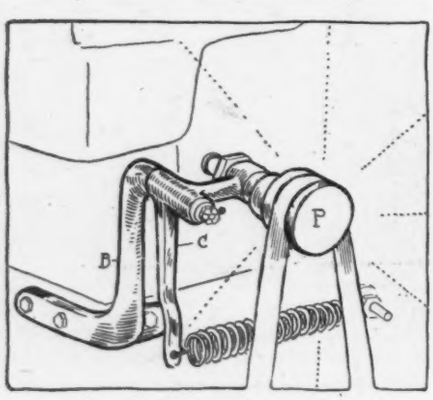



FIG. 4—STEVENS-DURYEA FAN

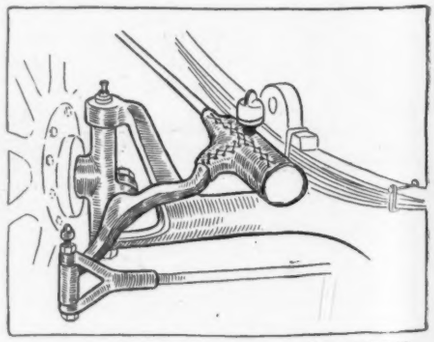


FIG. 2—PACKARD STEERING CONNECTION

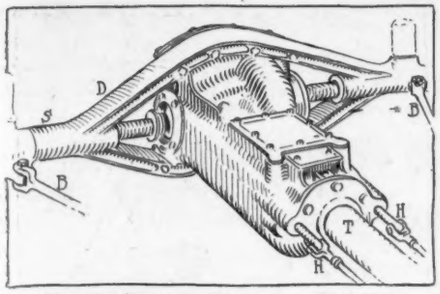



FIG. 5—STEARNS TOWN CAR GEARSET

trated in Fig. 4, in which a bracket B secured to the front cylinder casting supports a bell crank C to one arm of which is attached the coil spring and the other arm carries a spindle for the fan. The spring is constantly under tension and so is continually pulling to keep the belt tight.

The most interesting rear axle at the show is the Stearns used on its shaft-driven cars and duplicated on its town cars excepting that the gearbox in the latter is supported on the back axle. As illustrated in Fig. 5 the stationary portion is a forging with a diamond center D and end parts S drilled to take the axle drive-shafts. In the four-cylinder touring cars the differential is held within the diamond part and in the town car, as illustrated, the entire selective gearbox is supported therein, being bolted to the upper and lower arms of the diamond. The drive-shaft is encased in a tube T which at its forward end is supported in a ball-and-socket support from a cross member of the frame. The symmetry of the design is accentuated by disposing one of the gear-shifter rods H at one side of this tube and the other at the other and also by the simple operating selective device as seen in Fig. 6, in which there are two drop rods R from the change speed lever sleeve, the right one in the illustration locked in the inverted U in the end of the shifter rod and by moving the change speed lever into the outer slot of the lever quadrant the inner arm R locks in the left shifter rod. The device is extremely simple. The propeller shaft tube T is supported midway of its length by angular brace rods B extending from the rear axle ends.

The new Matheson six motor, interesting because of the adoption of jump spark ignition, as well as by having cylinders without detachable heads as previously used by the company has an interesting valve action, Fig. 7, in which flat seated valves with a 2-inch opening in the clear are used, each valve being carried in a separate cage secured into a recess in the cylinder head by a locking ring. Each rocker arm

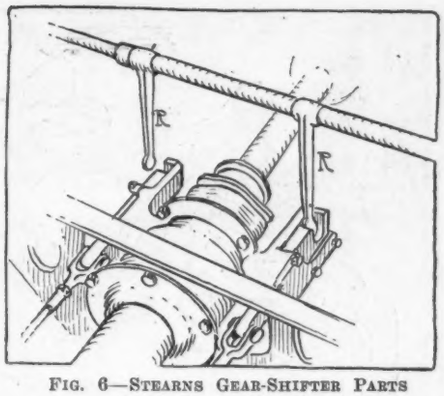
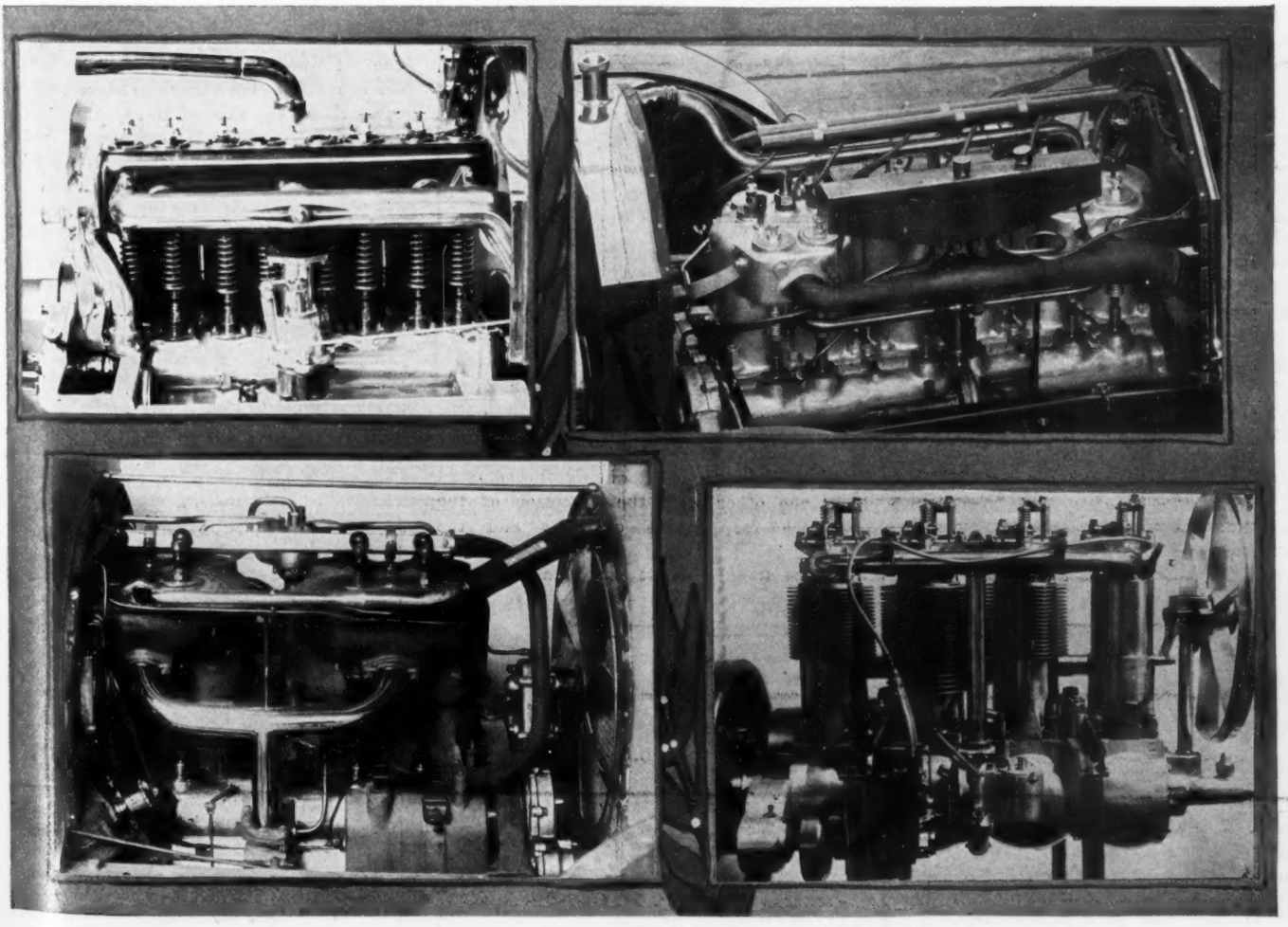



FIG. 6—STEARNS GEAR-SHIFTER PARTS

R has a slightly convexed end where it bears upon the top of the valve stem and the opposite end is concaved to take the ball head on the lifter rod L, there being no hinge joint as frequently used at this point. A small coil spring S holds the rocker arm constantly on the ball end of the lifter rod. All adjustments of the timing of the valves are done by nut and lock nuts at the lower end of the rods.

On the small Lozier six which is designed quite differently from the Lozier four-cylinder types not a few details of more than passing interest appear. A minor one is the roller top R, Fig. 8, of the accelerator pedal so that in applying



STEARNS FOUR-CYLINDER ROYAL TOURIST MOTOR

PIERCE-ARROW SIX FRANKLIN AIR-COOLER

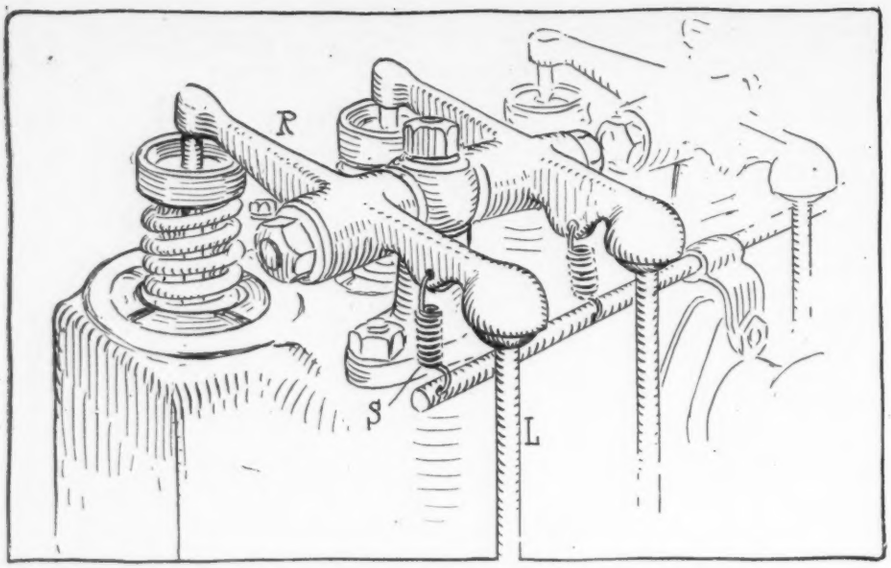



FIG. 7—VALVE ACTION ON MATHESON SIX

pressure to the pedal the toe of the foot is pressed down, the roller R revolving under the pressure and carrying the pedal away from the driver. Its presence eliminates the necessity of having to raise the heel of the foot off the floor board. Fig. 9 shows the tubular subframe T for supporting the motor and gearbox and illustrates how the end of the gearbox supporting arm A as well as those of the crankcase are concaved to fit over the top half of the tube. A semi-cylindrical cap C fits against the lower part, a pair of studs binding the cap in place. The end of the tubular subframe is supported through a thimble T1 pressed through a hole and riveted to a cross member F of the frame.

Particular interest attaches to the double ignition system on the cars exhibited because of the recent patents allowed Elmer Apperson on this system. A change appears in the Apperson double system of a year ago in that both sets of spark plugs are now carried in the cap over the intake valve, Fig. 10, instead of having the battery set in the caps over the exhaust valves. The theory of placing plugs over the intake valves is that a richer mixture fills this part of the combustion chamber than that over the exhaust valves and consequently there is a quicker explosion and much higher motor efficiency. The Apperson ignition sets are entirely separate not a part of one system being incorporated in the other with the exception of the switch for cutting one out and the other in.

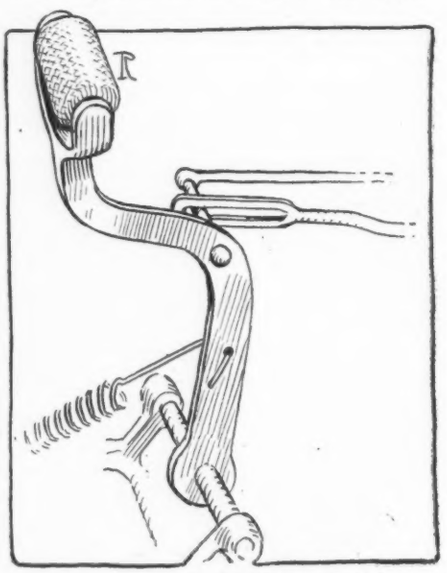



FIG. 8—LOZIER ACCELERATOR PEDAL

The Royal Tourist motor is unique in two respects, first, because of the self-starter, and, second, because of the peculiar means used of switching from the battery to the magneto and vice versa. Fig. 11 explains it. Passing over the cylinder heads is a hollow square tubing into the front end of which enters the magneto wires M and the battery wires enter the rear end. On one side of this rod is a set of plunger connections A and on another side is a similar set B one connecting with the magneto wires the other with the battery wires. The shaft is rotated by a lever L on the dash and as illustrated neither set is on, but with plungers A contacting with the eccentric topped spark plugs P one set would be on, and with the other set contacting the other system would be in service. The tops of the spark plugs A are inverted eccentric thimbles P which can be partly rotated to take up wear on the ends of the plungers A or B. On this car is a simple folding starting crank, Fig. 12, the heavy line showing it folded back parallel with the short shaft H to the crankshaft and the dotted line showing it ready for cranking. The crank hinges to the forward end of the shaft H and has a plunger S which enters a recess to lock the crank in its folded position and into another recess to lock it in.

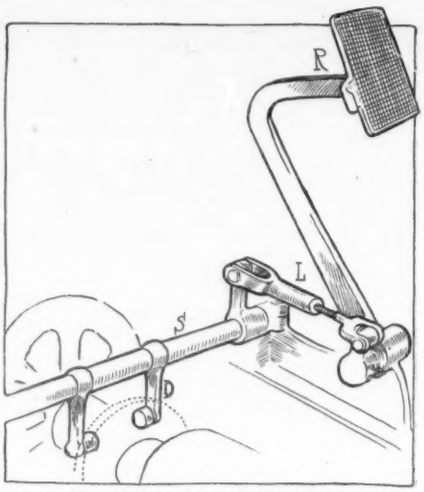



FIG. 13—CORBIN CLUTCH PEDAL LEVERAGE

Although the Corbin car has had its clutch spring increased in strength the amount of pressure needed in disengage-

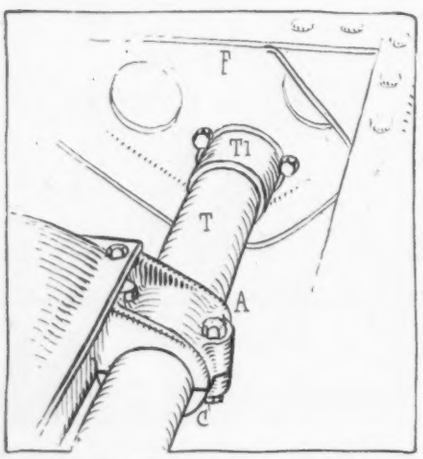



FIG. 9—LOZIER TUBULAR SUBFRAME

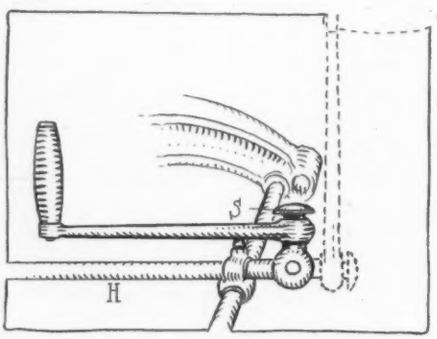



FIG. 12—ROYAL'S FOLDING CRANK

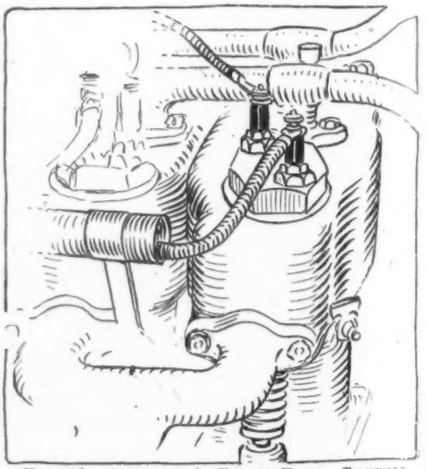


FIG. 10—APPERSON'S SPARK PLUG SYSTEM

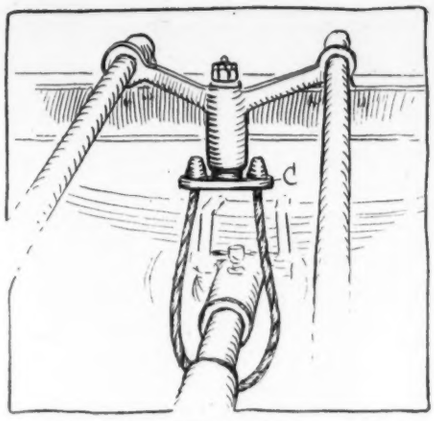



FIG. 14—SPRING REBOUND STRAP ON HAYNES

ment is actually much less than heretofore, which is explained by the compound linkage between the clutch pedal P, Fig. 13, and the shaft S carrying the two drop arms D which pull the clutch rearward. The shaft S carries a short vertical arm to which hinges an adjustable link L which attaches to a short arm on the clutch pedal shaft, the result being a compound leverage with the already mentioned results.

Among the improvements on the Haynes car is what might be termed a combination spring and cable rebound strap illustrated in Fig. 14 in which the looped cable beneath the axle attaches at its end to a plate C on which is a vertical pin with head operating within the cylinder above it, a coil spring within the cylinder constantly tending to hold the plate up to the cylinder's lower end, as shown, is the big absorbing factor.

The Palmer & Singer cars make use of a couple of universal joints J in the drag link of the steering gears, Fig. 15. The radius arm R ends in a yoke, so does the drag link D and both are united by a cross piece. The same construction is used at the forward end. In this steering gear the drag link is carried well up alongside the frame members and the connection with the steering knuckle is above the axle instead of beneath it.

In pedals for operating the clutch and brakes, it is now customary to employ the

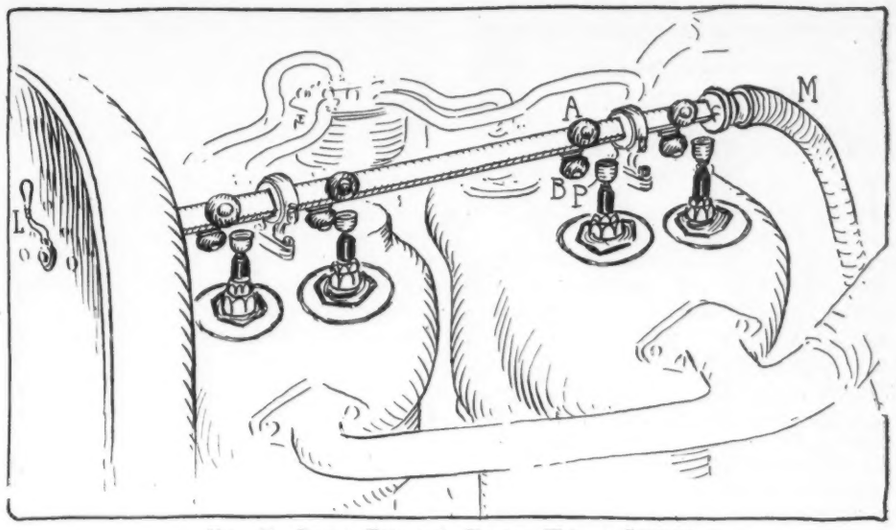



FIG. 11—ROYAL TOURIST'S UNIQUE WIRING SCHEME

goose neck style in which the pedal works through a single opening in the toe board instead of through a slot. There are a few examples of the slot idea but their numbers are gradually decreasing. The tops of many pedals, or foot-rest pieces, as they might be termed, are generally hinged so as to better adapt themselves to the angle of the foot, but in addition to this a couple of makers of cars, the Thomas and Walter, have fitted adjustable toe pieces in which they can be made shorter or longer to suit the stature of the driver. In the Walter, Fig. 16, the toe piece carries a long threaded stem P which threads through the top of the pedal arm and a lock nut retains any adjustment. This permits of any variations of length within the range of the threaded part of the toe piece stem but makes no provision for tipping or tilting of the toe piece. On the Thomas small six car both length adjustment and tilting to suit the foot angle are possible, although the toe piece is locked at the desired tilt angle. The extension work is done by using a pair of side pieces S, Fig. 17, with a series of five holes in each, through which a bolt passes securing them at one end to the pedal arm. At the other arm they clamp a lug on the toe piece between them and a second bolt holds the required adjustment.

All the motors in the show are of the four-cycle type excepting the Elmore, which is of the two-cycle sort. Twenty-seven different makers produce four-cycle motors, among these being the Apperson, Cadillac, Chalmers-Detroit, Corbin, Columbia, Elmore, E-M-F, Franklin, Haynes, Palmer & Singer, Knox, Locomobile, Lozier, Matheson, Packard, Peerless, Pierce, Pope-Hartford, Pope-Toledo, Royal, Selden, Simplex, Stearns, Stevens-Duryea, Studebaker, Thomas and Walter.

In the six-cylinder class will be found the Franklin, Palmer & Singer, Lozier, Peerless, Pierce, Stevens-Duryea and Thomas, but all of these also make four-cylinder motors. The only exclusive six-cylinder producer is the Winton company. The highest powered motor in the show is the six-cylinder 72-horsepower Thomas, and the lowest the Cadillac 10-horsepower.

Eleven of the makers cast the cylinders separately—the Apperson, Autocar, Corbin, Elmore, Franklin, Palmer & Singer 57, Knox, Matheson, Pierce 4-40, and the Stevens-Duryea light 6-36. Nineteen cast their cylinders in pairs and they are all found on the Chalmers-Detroit 40, the Columbia, E-M-F, Haynes, Palmer & Singer 28, Locomobile, Lozier, Packard, Peerless, Pierce, Pope-Hartford, Royal, Selden, Simplex, Stearns, Stevens-Duryea, Studebaker, Thomas and Winton. Only one makers casts his cylinders in sets of three—Thomas in his 4-60 and his 6-40.

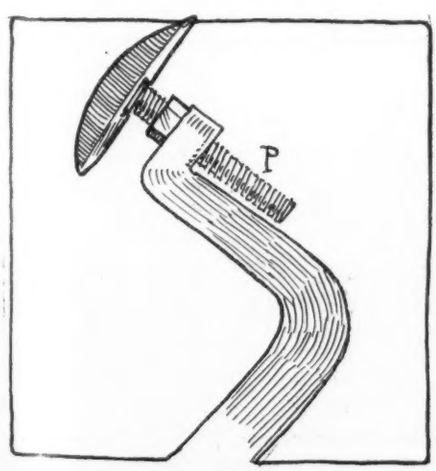



FIG. 16—THE WALTER PEDAL

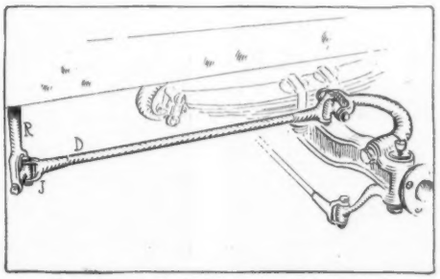



FIG. 15—P & S STEERING DRAG LINK

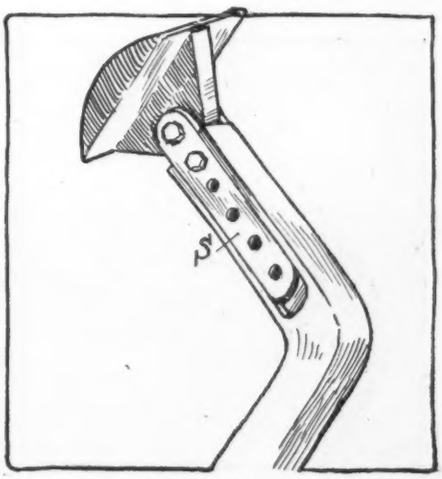



FIG. 17—THOMAS ADJUSTABLE PEDAL

## Commercial Section Disappointing

THE exhibit of gasoline and electric commercial cars in the basement is disappointing and often the spaces go begging for spectators while neighboring spaces are packed to overflowing. This reminds a spectator of the recent commercial show in Paris in conjunction with which was an exhibit of airships and the air creations took all of the attention and the commercial machines went without much notice. To be frank, the number of commercial machines on exhibition is not sufficiently large to warrant business men interested in the field coming to the show solely on that mission. The machines that are exhibited are prolific in improvements in some cases and it is not that the firms exhibiting have been asleep during the year, far from it, but rather because of the few exhibitors. There are three exhibitors of large gasoline vehicles, Knox, Sampson and Hewitt, with Franklin and Autocar in the lighter-weight machines and Thomas and Autocar in the taxicab and town car field. In the electrics Studebaker, General and Champion are in place.

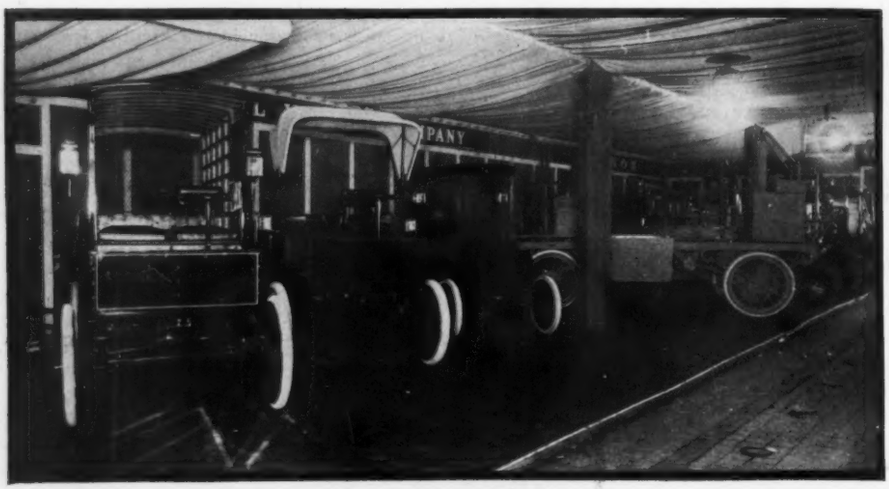
In looking carefully over the gasoline field it appears that some disappointment has been encountered by purchasers of gasoline cars, not because the cars did not make good, but because the buyer had failed to get the type or size of machine best suited for his particular field. It would be absurd in the pleasure car field for a woman who wished a car for shopping purposes only to buy a 50-horsepower touring car when a little town car or electric vehicle is better suited to her needs; but this is exactly what has been happening in the big business field, men who should have bought the 75-horsepower racer having purchased the small electric and vice versa. A probable solution would come, as suggested by a Knox representative, in the services of a consulting engineer in the employ of the company making the machines, whose services would consist in making a visit of a week or more at the zone of activities of the concern buying the truck so that the complete range of activities of the truck could be studied and a vehicle well suited to the needs of the purchaser sold. In this way the maker would know exactly what was needed and the buyer would be brought closer in touch with the range of different size of cars and their possibilities and limitations.

ENTRANCE TO COMMERCIAL SECTION

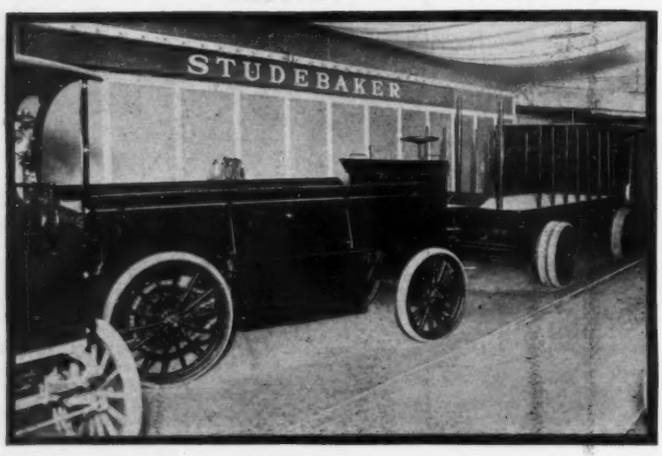
It is a fact that during the past few years commercial cars have in not a few instances been consigned to the storage plant not because of their failure to operate but because the wrong type of vehicle was used. It is another example of Shakespeare's line "How many things by season seasoned art": Put a too-speedy truck in the hands of a concern solely engaged in depot traffic and it will prove a poor investment, but a slow-speed big-carrying capacity machine would succeed.

The exhibit of the Knox fire wagons shows admirably the possibilities of motor vehicles in this department as well as suggests the many avenues ready, wide open, for the successful industrial machine. The 350-pound load-carrying electric but indicates a new field for the battery machine and the sight of New York streets filled with taxicabs, the majority of them of foreign make, tells in unmistakable tones of the market for these little cars.

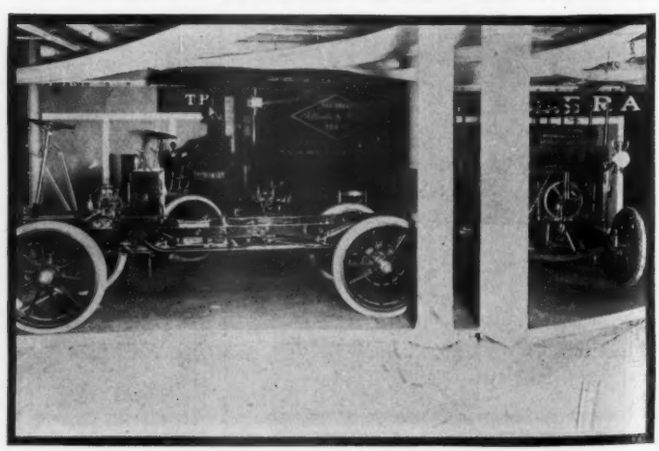
In the construction of commercial machines many interesting problems are being wrestled with. In electric machines the reduction of weight in big trucks is



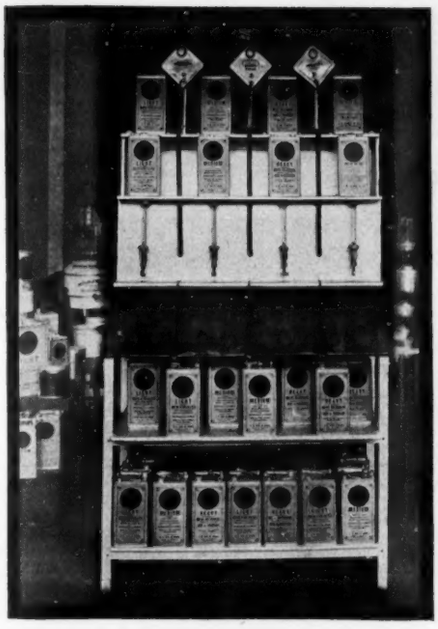
GENERAL VEHICLE CO.'S ELECTRIC COMMERCIAL




STUDEBAKER COMMERCIAL LINE



AUTOCAR AND FRANKLIN



DISPLAY OF HARRIS OILS

a paramount factor. As much as a ton has been cut from some of the big electric vehicles, made possible by the use of higher carbon steel, specially built single motors and the reduction of battery weight. With big trucks weight reduction is along the right road as it means less weight on tires, which, after all, proves to be a big factor in selling trucks, as is corroborated by conversations every day at the show.

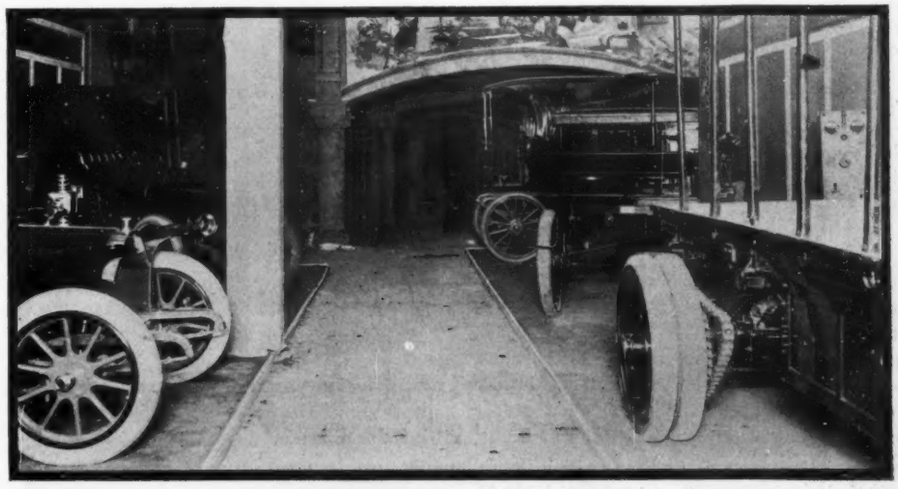
In gasoline trucks the magneto ignition has been accepted during the year, so has the four-cylinder motor for big machines; and such details as enclosed chains and good mud aprons cannot be overlooked. The Sampson truck fits a device whereby the differential can be locked to allow of the car making headway should a drive-chain break or one wheel get into a soft spot. The twin tire has resulted in much better service on the driving wheels and enlarged springs have done much to improve the riding qualities.

## Chapter on Radiation Characteristics

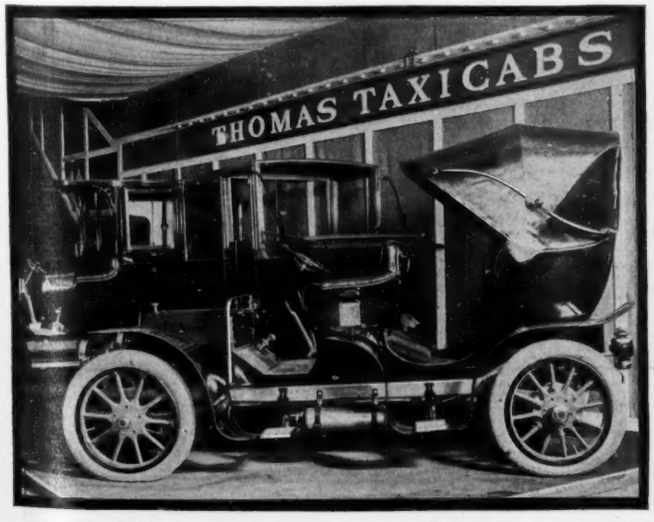
IF there is any tendency toward thermo-syphon cooling, it is not apparent at this show. There is one exception, the Hewitt truck, which uses the thermo-syphon system. The majority of the cars use the forced systems with cellular radiator, centrifugal pumps and fans. There is a tendency toward larger radiators, not because the old ones were insufficient, but the usual explanation is a desire to obtain a higher hood. The method of fan drive is about an even break between the bevel gear drive and the belt. It is noticed that in the majority of cases on bevel gear-driven fans, there is a friction clutch at the fan to overcome the inertia. There also is a tendency to shorten the hoods by placing the fans on the front cylinder instead of on a separate bracket. This is the case on the Packard. On the Columbia and Simplex, the spokes of the flywheel form the only fan used. On the Apperson, in addition to the fan in the flywheel, a belt-driven fan is used. On the Thomas, blades fastened on the periphery of the flywheel form the only fan used. The Pierce-Arrow, which always has used a flat belt, now is using a V-shaped belt. The Corbin uses an endless rope for a fan drive.

On the radiator proposition, the cellular type seems to have the lead, although a great many tubular, both of the round and rectangular types are exhibited. The Franklin exhibit is the only exclusively air-cooled pleasure car shown, and on this motor, to facilitate the cooling, the auxiliary exhaust, together with the Franklin concentric valves, are used.

The pump question is about evenly divided between the gear and the centrifugal pump. The Haynes and Apperson makers use an eccentric pump. There is a growing tendency to place the pump back from the radiator and behind the forward motor supports to promote accessibility. Whether the motor car exhibited uses air or water, thermo-syphon or forced circulation, auxiliary type of pump or radiator, it would be practically impossible to select any here which with modern day handling could run hot.



THOMAS AND STUDEBAKER COMMERCIAL EXHIBITS




THOMAS TAXICABS

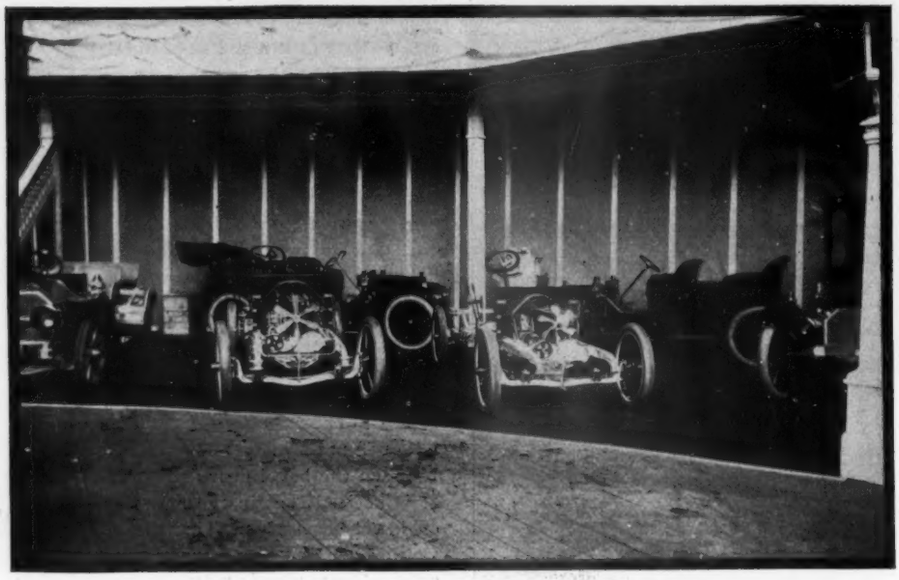
KNOX FIRE TRUCK

## Great Ethusiasm Over Motor Cycles

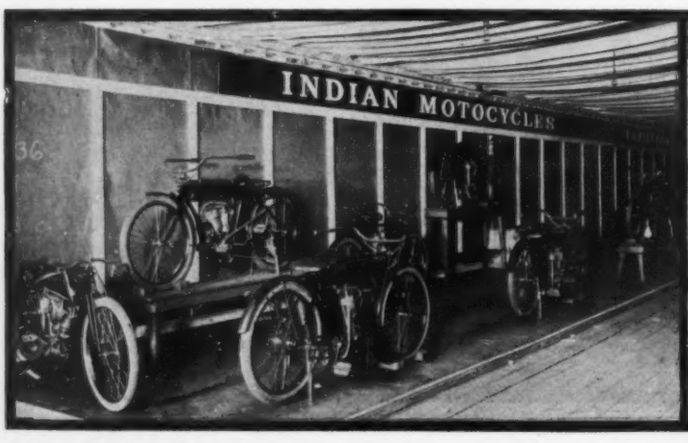
NO other part of the exhibit spaces in the garden is busier than the motor cycle department in the basement, which is well segregated through a transverse aisle in the center of the basement and continuing around the crescent of the east end. Upward of thirty exhibitors are in place, all of them with a machine or two and some with five or six. During the afternoons and evenings the space is crowded, the spectators not being content to stand in the aisles and ask questions, but filling the spaces, sitting on the machines, trying the grip and other controls and having the details of the improved ignition, sight lubrication, new brakes and a dozen of the other features explained to them. It is activity and optimism combined. Everywhere in the stands conversations are noted regarding the Federation of American Motor Cyclists and its policy for the approaching season; and at other places the newly organized Motor Cycle Manufacturers' Association is heard of and makers anticipate much mutual good to come from the councils of the many meetings as well as the work of the different committees of the association.

It may be said that the dawn of the halcyon days of motor cycling in America is breaking, the red streamers are ribbing the eastern sky and soon the big round sun will peep above the horizon and begin its march to the noonday zenith. All of the makers are bubbling over with enthusiasm. No wonder they have so much to talk about. If it is not two-speed gearsets then it is expanding brakes, magneto ignition or mechanical intake valves. These are the days when motor cycle engineers rarely go to sleep at night, but must be ever alert to rush these graceful two-wheelers to an early state of perfection. The problem of wheelbase is practically settled and measurements range from 54 inches in single-cylinder machines up to 57 and 58 for twin or triple motor types. As to how many cylinders will prove most popular diversity reigns, even makers being rarely contented in their own minds as to whether one, two, three or four should be used as is demonstrated at stand after stand where single and double-cylinder machines stand side by side. The Curtiss shows a three-cylinder one with the cylinders disposed in fan-flare order; the Ovington and Pierce have four-cylinder types with mechanical valves and shaft-drive, and the Ovington also shows a single-cylinder machine with the crankshaft placed longitudinally to permit of shaft-drive. On the New Era a pedal-operated expanding brake is used, as is a planetary gearset with two forward speeds controlled by pedals on the left side of the floorboard. The low speed has a gear ratio of fourteen to one for starting and is through a planetary set, and direct drive is on a four to one ratio. Applying of the band brake disengages the high speed cone. The three-cylinder Curtiss uses two carbureters and has a gear ratio of two and one-quarter to one. The Excelsior motor cycles use single-cylinder motors of comparatively slow speed, ranging from 240 revolutions per minute to 375, the former rate giving a 60-miles-an-hour pace. This motor cycle has an equivalent to the clutch in the motor car in that the driving belt can be tightened and loosened at will by the driver through a convenient lever which operates an idler against the belt. With the belt slack the motor can be started and the machine remain stationary, and gradually bringing the idler into action gives a result the same as the gradual engagement of the clutch. Indian motor cycles give an option on the mechanical and automatic intake valve; and it is natural to expect that the development of the motor cycle motor will to an extent follow in the wake of the evolution of the gasoline motor in the car field, in which the automatic intake valve had a large initial following which gradually diminished until at the present time scarcely a vestige of it remains.

Two things that augur well for the future of motor cycling are the perfected muffling arrangements and the better braking that is coming to the front. From a casual glance at many of the machines it would appear that the due balance between motors on one end and brakes on the other has been to a large extent forgotten by many makers. The motors have been perfected, making 60 miles an hour possible, but the brakes have been left



FINE DISPLAY MADE BY THE STEARNS COMPANY




INDIANS IN LINE

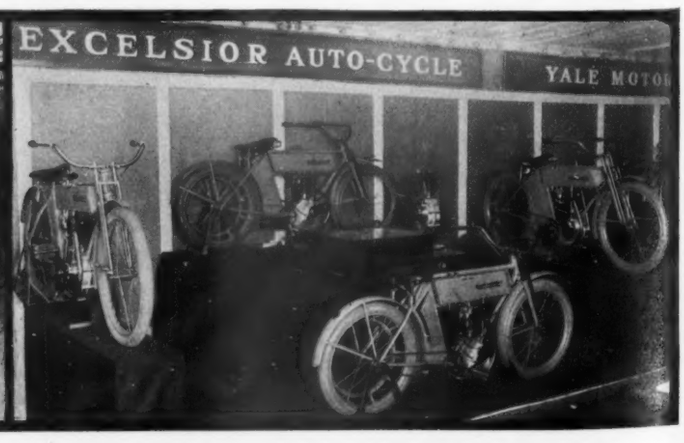
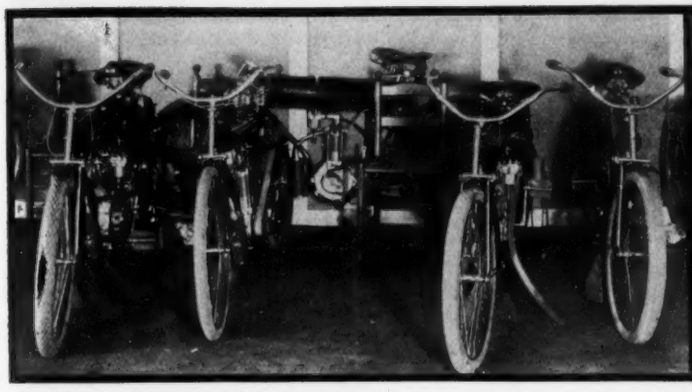
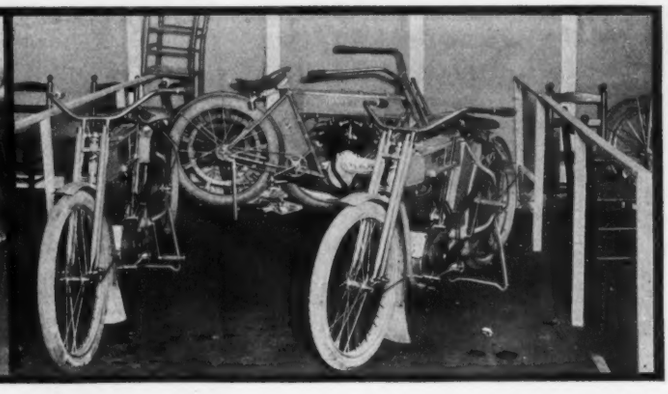



EXHIBIT OF EXCELSIORS



RELIANCE MOTOR CYCLES



HARLEY-DAVIDSON LINE

practically where they were when the motors were capable of 45 miles an hour. It will prove particularly disastrous if the brake situation is not grappled with in an able manner and the rider provided with a commensurate braking system. The making of larger mufflers and the introduction of cut-outs shows how history repeats itself in the development of different industries. The days when a motor cycle entering a city park suggested a near-by gatling gun in action are over, and during the coming year the machines will glide by as quietly as the big cars and if it comes to a sprint or a big hill the cut-out will permit of all the fireworks desirable.

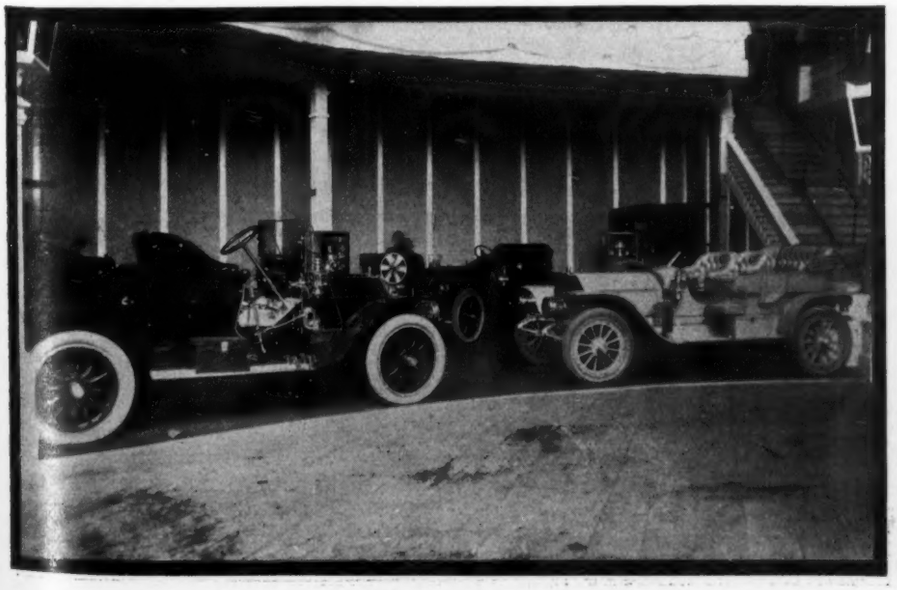
The magneto has already hit the crest of the big tidal wave of motor cycle development and at the next show every machine will be fitted with one. The high-tension type is popular in that it is a contained unit, a most important consideration where space is so limited as in motor cycles. A few of the makers drive the magneto by enclosed chain, whereas others gear it direct and here again a return to motor car practice for a moment's resume will show that this was the course followed in the early car days, but was surrendered after a years' experience.

The increase in the motor power and slight increase in weight call for perfected lubrication, and it is surprising to note the large oil reservoirs provided and to see the sight feeds that are placed on not a few of the machines. The accepted oiling system is to feed by gravity from the oil tank carried well up on the frame to the crankcase, the oil passing en route through glass sights and the oil duct provided with a valve to stop the flow. A few makers show the plunger pump method in which oil is forced direct to the crankcase by a few strokes with the pump. This system depends largely for its efficiency on the rider and is not the constant feed the pressure or gravity one is. With the pump a considerable amount is fed at once, and no more for some time. This means an uneven level in the crankcase.

FIRESTONE TIRE BOOTH

In the carburation field, although the majority of makers use stock motor cycle carbureters which the big motor car carbureter men are making a tendency is appearing in which individual motor cycle makers are fitting carbureters of their own design. As yet many of the carbureters are simple constructions, not combinations of spring-controlled auxiliary air valves and regulable spraying nozzles, but in another year many of these carbureter features will be in place.

It would be entirely faulty in a brief resume of this nature not to glance at the efforts made to make motor cycling comfortable to the rider. In this aim the spring fork has been a big factor, as it takes the road vibration off the arms and body of the driver. The vibration of the motor is not the big factor to be overcome, but the vibration caused by road conditions. Besides the spring fork there is the spring seat post as used on the Greyhound machines. Larger saddles are coming into use and the driver now is seated between the wheels, giving a much better riding machine. The motor is hung low and well forward in some to lower the center of gravity, thus giving a machine easy control and removing the cylinder heat as far as possible from the legs of the rider. Efforts are being made to strengthen the frames, one maker showing reinforced tubing throughout in the machine, the reinforcement taking the nature of a partition throughout the tubes dividing them into equal compartments. Clincher tires are everywhere. The belt and chain drive controversy is far from settled and time alone will be the impartial arbiter of the conflict. The big acetylene headlight is in place and it would appear small electric headlights supplied from the magneto might be used with profit by the rider of the speedy motor cycle.



KNOX HAS A SNUG NOOK AND A FINE DISPLAY

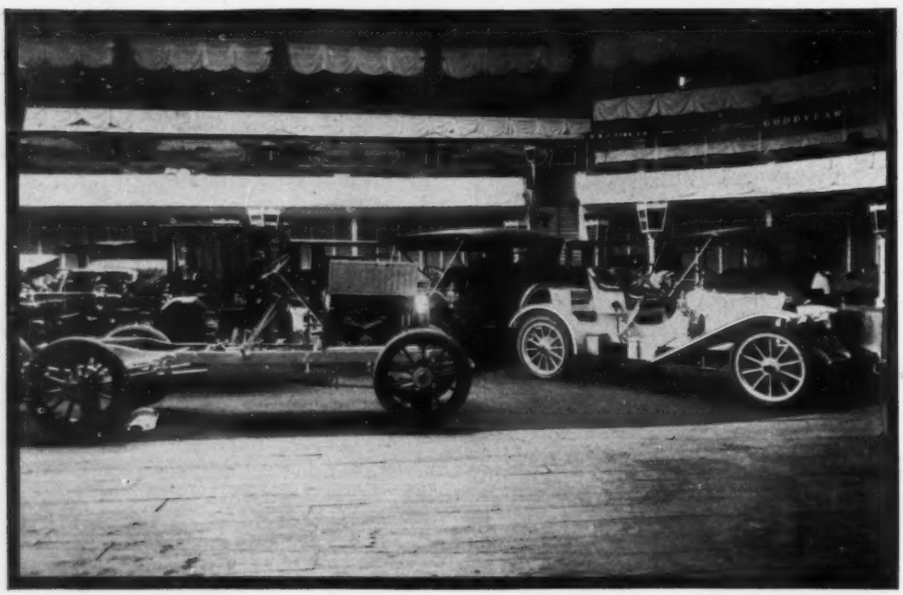
## Study of Car Brakes Is Interesting

THERE is no part of a motor upon which so much dependence is placed as on the brakes. Possibly the brakes were the first part of the motor car to be absolutely perfected. A survey of the garden exhibits would indicate this, as the brake proposition is practically a repetition of last year's design. While this is true in the majority of cases, it would appear as if the brakes were not beyond the fool-proof stage due to the spectacular stops practiced by many drivers to avoid trouble from this source there is an increased tendency to depart from the metal-to-metal friction surfaces and adopt such materials as camel's hair belting, leather, raybestos, thermoid etc. A larger proportion of the cars seem to be equipped with brake equalizers than formerly, and there is a decided inclination to depart from the brake on the driving shaft and to adopt the double brakes on the rear wheel hubs. These vary according to the whims of the designer; some having double contracting bands on one drum; others use two drums; some have internal and external brakes on the same flange; others have two flanges for the purpose.

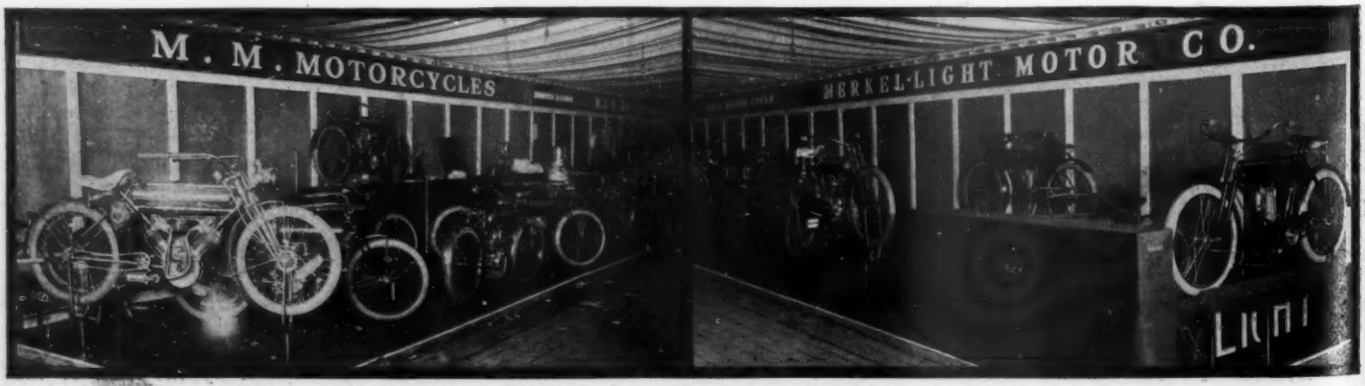
Water-cooled brakes have been used on European cars for some time, but the Haynes is the first prominent American make to adopt this feature. The Haynes method is somewhat unique,due to the fact that the cooling system is a self-contained break drum, which is water-tight around its periphery with vents enough for heat to escape in the form of steam around the axle. The majority of makers are using pressed steel drums for brakes instead of the cast iron or steel, as formerly. It is not noticed that there is an inclination toward simple brake adjusting features, except in one or two instances, the majority of cars depending on turn-buckles, and lock nuts on the brake rods.

The Royal Tourist probably has the greatest friction surface, having brake drums 14¼ inches in diameter and 3½ inches wide. On this car the brake bands and contracting levers are anchored to the strut or radius rod, as is the case of the Locomobile. A new type of brake equalizer is used on the Royal Tourist which consists of a small pinion differential on the cross rods, the pull from the foot and emergency brake levers being on the differential or equalizing gear. The brake equalizers on the Pierce-Arrow operate through slots in the frame.

SOUTH AISLE ON MAIN FLOOR OF GARDEN



PEERLESS STAND ON MAIN AISLE




MARSH-METZ MOTOR CYCLES

MERKLE MOTOR CYCLES

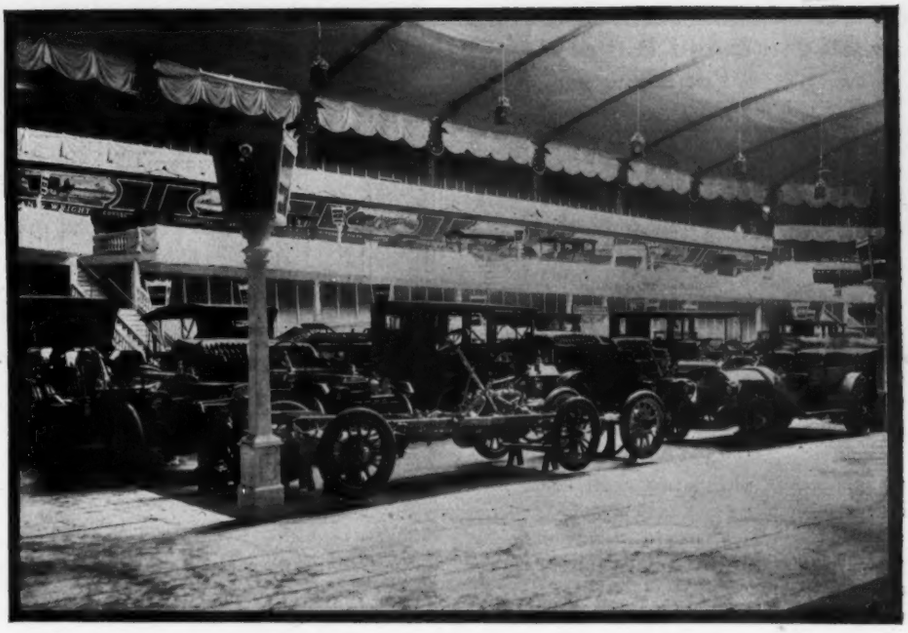
## Floating Type Axle Is Popular

THERE are very few exceptions to the shaft-driven car, and this season sees a great increase in the popularity of the floating type of axle. The construction of these vary from two-piece steel stampings to chrome nickel steel tubes forced into cast differential housings, such as is used on the Locomobile shaft-driven car. There is a growing tendency toward accessibility in these axles to permit the easy removal and inspection of the differential.

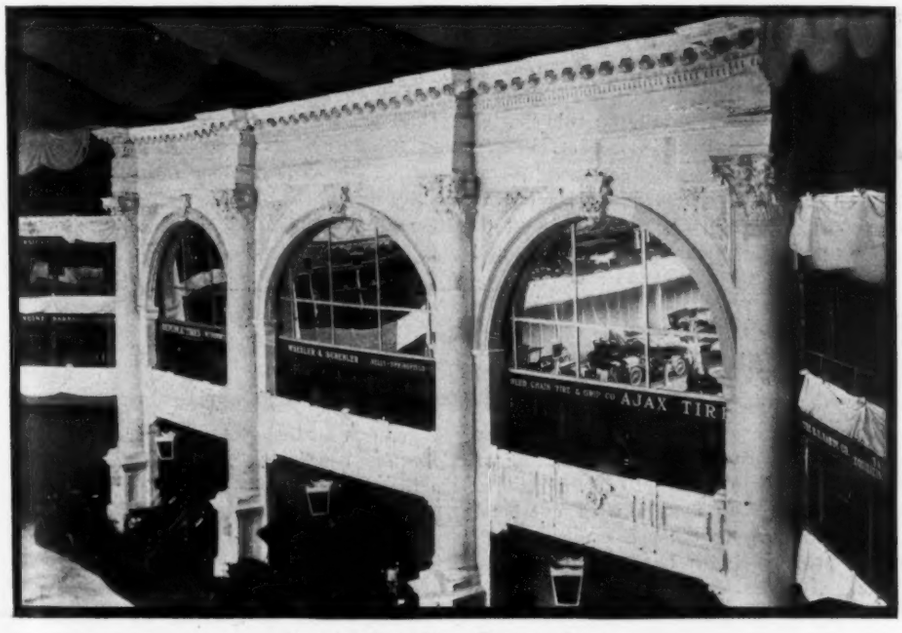
On the Locomobile, the axle casing is left free to rotate in the spring seats, and this part is provided with a grease cup to provide lubricant. The strut rods are connected at the seat and frame end with swivel and loose joints to avoid any bending strain. A great many designers are providing an extra bearing on the drive shaft at each side of the driving pinion. This is seen on the Royal Tourist as well as a thrust collar to take the thrust from the differential instead of depending for it on the annular bearings. The practice of having the driving dog loose on the end of the live axle is being superseded by having it integral and a little more substantial than in former years. The rear axle on the Stearns town car is a new example of the designer's art and evidently is a strong proposition. The truss of the I-beam section is in the form of a diamond supporting the differential case in the center, the ends being securely fastened to the tube on which the wheels are carried. Among the cars whose designers still pin their faith to the semi-floating type of axle is the Packard, whose rear axle construction is much the same as last year. The Haynes, Knox and Corbin use the semi-floating axles.

On the Studebaker is seen a new type of spring clip for the front axle. This clip, made very heavy, is used singly instead of in pairs as usual, and it grips the axle through holes drilled through the axle proper instead of through the spring seats. On the Stevens-Duryea, the spring clip is made in one piece, nearly the same size as the spring seat, the four threaded lugs clamping the spring to the axle in the usual manner.

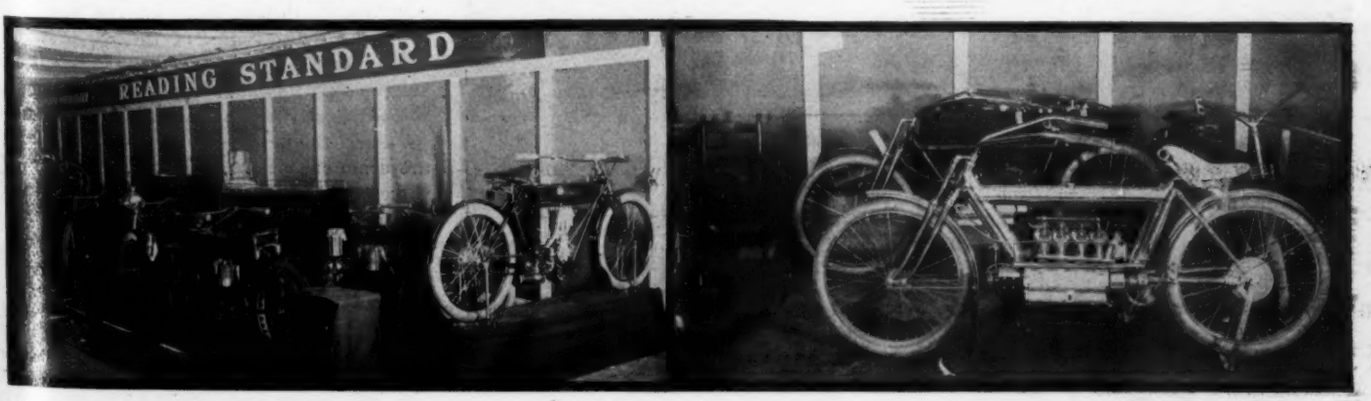
Three-quarter elliptic springs are in evidence on several makes of cars, and may supplant the platform springs in time, although there are several makers showing platform springs yet.



LOCOMOBILE'S PROMINENT STAND IN MAIN AISLE




BIG ARCH AT EAST END OF GARDEN

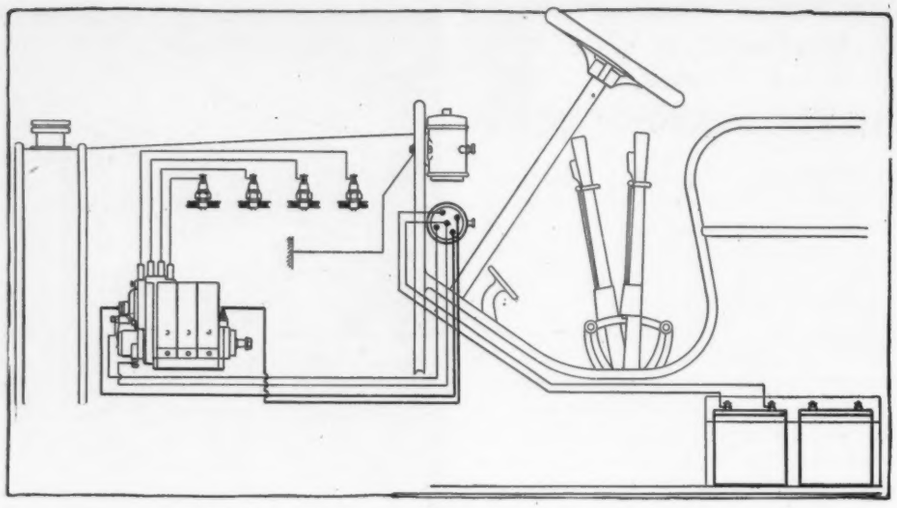



READING STANDARD BOOTH

PIERCE FOUR-CYLINDER MOTOR CYCLE

## Magneto and Battery Are Popular

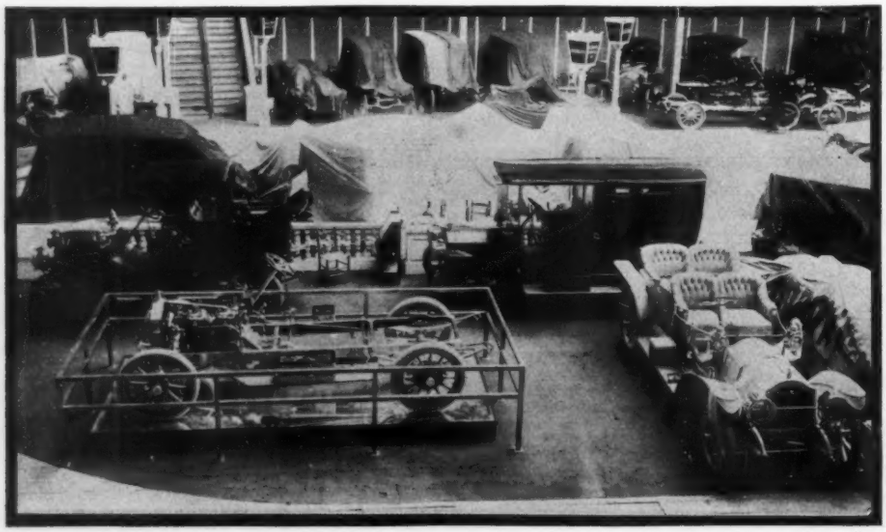
TECHNICAL make-and-break has but two out-and-out exponents, the Locomobile and the Columbia, the Matheson keeping to it only on the four-cylinder cars, the six-cylinder model having the magneto and battery system. The magnetic plug, of the Bosch-Honold system, has one exponent in the Studebaker, in which the low-tension magneto has a separated double winding on the armature and a winding on the magnetic plug. The one-time battery, only high-tension ignition, is shown on but two makes and these are admittedly past models and in each instance the maker has a new model on which is used the combination of magneto and battery. The newest thing in the combination is the Bosch dual ignition which does away with the commutator timer or contact-breaker as a separate part. On the dashboard is placed a round metal case in which is a coil of similar design to the I armature of the Bosch arc light magneto, with a trembler at the top. This coil rests on a connection plate that is in the bottom of the metal case, with five wire connections. Connection is wired to the battery and to a special contact-breaker worked by the magneto shaft. One connection is the short-circuiting terminal wired to the magneto proper, both being of low tension. The other low-tension circuit is from a fifth connection to the battery. In the high-tension circuits are wires running to the magneto terminals, the latter being to the distributer of the magneto circuit. The battery contact-breaker, or current-distributer, is concentric with the magneto circuit-breaker and is driven by the same shaft. For starting on the battery a button is depressed in the top of the metal casing holding the coil, thus short-circuiting, providing the breaker is in position.



CONNECTIONS ON THE BOSCH DUAL IGNITION SYSTEM

Ignition by magneto alone has four exponents, with about the same number using the magneto and battery in combination, such as the dual system above explained. In the balance of the cars, about two-thirds, the magneto and battery are completely separate systems. The subject of positioning the magneto as to the carbureter presents an interesting study. Many makers take up this matter as to the possibilities in a short circuit igniting vapor from the carbureter, and place these two on opposite sides of the motor. This method prevails in about 60 per cent of the makes. Strapping and bolting the magnetos in position each has its advocates, with the former in the majority. Where the separate systems of battery and magneto are jointly used, one-third of the makers are placing the plugs together in the valve cap, the balance separating the plugs, using both intake and exhaust valve caps for the seating of the two plugs to each cylinder, except in those cars having motors with overhead valves. Wiring to the spark plugs is directly attached, with but two exceptions, in one of which the wires terminate in a short drop-lever with an open-sided cap that springs over the spark plug upper end. In the other the wires are carried in a square tube that rocks one-quarter way in each direction. The rocker lever is on the back side of the dash board. Coming out of two sides of this square tube are spring buttons, one set for the magneto and one set for the battery. A concentric inverted bell-shaped brass cup is attached to the top of the spark plugs.

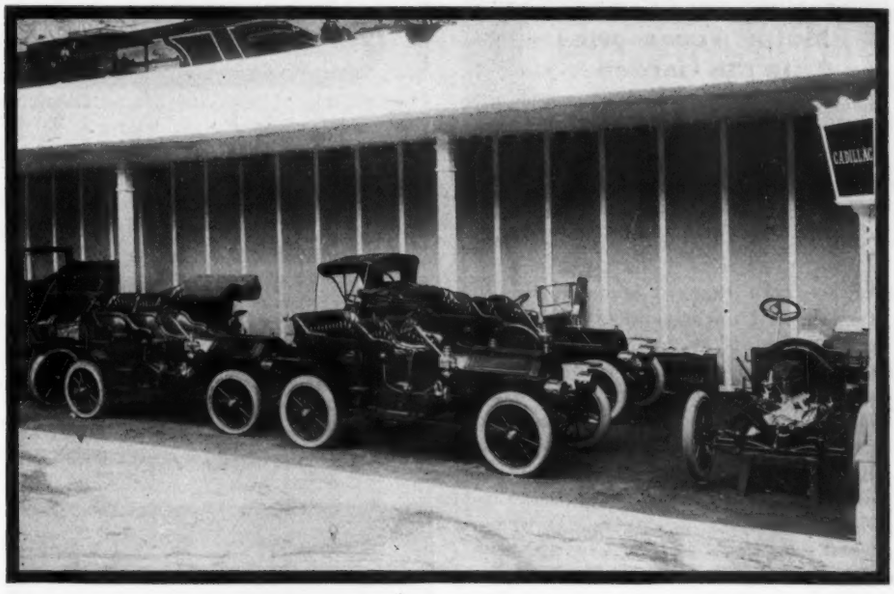
Carrying wires through tubes is a growing practice, fully one-half the makers showing this detail which had its best expression last year in the Peerless car and which is again shown. In most instances the tubes are arranged to carry the wires so that only the necessary ends of the latter are exposed. But one instance is noted of a governor on the magneto, this being on the Franklin car. Where timers are used there is a decided showing in placing them where they may be easily reached for any needs that may come up in their attention, the favorite position being well above the cylinder heads. But five models are shown where the timer is carried low or placed in a more or less inaccessible position, it being remembered that in the dual ignition the timer, as familiarly known, is done away with as a separate part running on a half-speed shaft. Where two sets of plugs are used and not seated together, one for the battery circuit and one for the magneto, it is usual to find the magneto plug over the intake valve or else placed in the head of the cylinder fairly near the center of the compression space, speaking of motors with side valves. In the first instance the battery plug is located over the exhaust valve, and in the second it is placed over the intake. There are some exceptions, however, to either of these conditions and wherein the positions are reversed, that is the magneto spark plug is seated in the exhaust valve cap and the battery spark plug placed over the intake valve chamber. Definite information as to why this reversal, of usually accepted practice, is the method used, could not be satisfactorily explained when information was sought.



PACKARD CHASSIS MOUNTED ON A MIRROR PLATFORM

## Gearset Tendencies at the Show

THE undoubted magnet of the gearset situation, as viewed on the cars on exhibition, is the tendency to place the gearset on the back axle, making it a unit with the axle. A few years ago Packard was the sole exponent of this design. With the introduction of its taxicab the Thomas company was added to the list, and this year the Thomas small six carries the gearbox in this position. But others are getting into the swing, among whom might be noted the new Matheson six and the Stearns town car, and the E-M-F. In some of these rear axle gearsets the housing carrying the gearset is a unit with that for the differential and in the Thomas whereas in others the gearbox is a separate compartment which bolts to the forward side of the differential. At the palace show many examples of the axle gearset were exhibited, so that after the Chicago show of February, when the grand roll call will be made, it will be seen that this design has been a big gainer durin gthe year. At that time the entire field will be under one roof and a comprehensive survey can be made which will be of value.




WHAT THE CADILLAC HAS FOR THIS YEAR

BIG LINE OF THOMAS CARS SHOWN

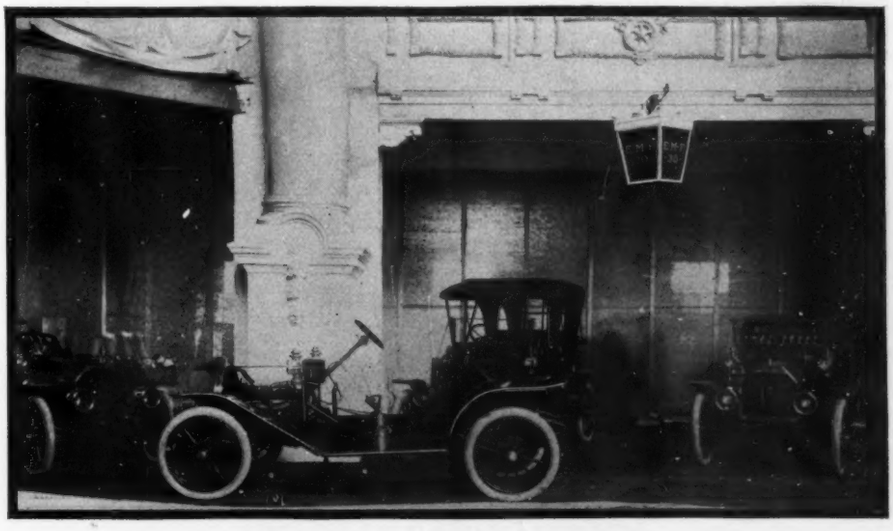
Everyone but one or two makes employ the selective set, there remaining some of the progressive change speed sets and a few examples of the planetary. The Pierce cast its lot in with the selective and has fitted a four-speed set on every model, with side lever control instead of steering wheel control. One of the Cadillac models uses the planetary, although the designer of the Cadillac Thirty uses the selective in his new model.

In gearsets with many makers the aim is to either make the set a unit with the motor or the rear axle, some makers preferring this to having three units to keep in alignment, the motor, the gearbox and the back axle. The Chalmers and Autocar belong to the gearbox and motor unit lot and the list of rear axle gearsets to the other division. The makers employing the three units use particularly stout frame construction, and some of them employ sub-frames well reinforced throughout their length.

The accessibility of gearboxes cannot be overlooked, which is evidenced by the rapidly removable covers on some of them, it only being necessary to turn a finger wheel to release a locking yoke. Facilities for putting oil or grease in without removing the cover are shown on some models.

There is a pronounced swing toward simplicity in the linkage between the change-speed lever and the sliding bars in the gearboxes for shifting gears. Many builders have but one drop arm on the sleeve carrying the change-speed lever, which drop arm engages in inverted U notches in the forward ends of the shifter rods, the entire system being encased. Others bring the shifter rods out through the front end of the gearbox, whereas some use a lateral compartment in which the shifter rods are housed to accomplish this aim in construction.

Another feature that has been almost universally adopted is the use of annular ball or roller bearings for the main and counter shafts, the plain bearings being now found only in remote cases on the modern motor car.



NEW E. M. F. MAKES ITS SHOW DEBUT

## Motor Accessories in the Garden

**Hartford Suspension Co.**—This concern shows the Truffault-Hartford shock absorber and the Vinet demountable rim, which the company is licensed to manufacture in America. The shock absorber has not been changed much during the year except in minor details. The friction surfaces in this absorber are between a disk of chemically-treated wood carried on the central arm and brass plates within the steel disks of the outer arms. The wood is carried within a brass cap to keep out wet and dust. The Vinet demountable rim attaches the clincher rim on the wheel felloe by a series of eight metal wedges at one side, these wedges being regularly distributed around the rim circumference and they enter between the rim and felloe at one side binding the latter in place. Each wedge has a radial lug extending alongside the felloe through which a transverse bolt passing through the felloe passes and holds the wedge in place, thereby securing the rim on.

**A. O. Smith Co.**—This Milwaukee frame and parts maker exhibits three miniature motor car frames complete in every respect but scarcely 2 feet long. They represent some of the types of frames made by the company: One is the conventional type with the side members offset at the dash, dropped in front of the back axle and having in addition a subframe member to support the motor and gearbox. A second style is the double-dropped type suitable for town car or taxicab work; and the third is the type that arches over the rear axle and is inswept at the dash. In addition the exhibit includes differential cases, brake drums, etc.

**High Frequency Ignition Co.**—This California company shows a novel ignition system consisting of dry cells, storage battery or magneto as the current producers. From these the current enters a primary non-vibrator coil carried in a regulation coil box and having within the box a condenser in parallel with the coil. From this the current is led through a single wire to a roller type of commutator on the motor and from this four wires lead to four resonators on the cylinders, one for each spark plug and each of which resonators connects with its spark plug by a short spring. Each resonator is a cylindrical fibre cased chamber approximately 2 inches in diameter and 1 inch long mounted on the top of the cylinder. Within each are two windings, a primary of seven laps on the outside and connected with a usual secondary winding of many turns within it and from which winding the spring connecting with the spark plug attaches. The theory of operation of the system is that when the timer is making contact the primary coil on the dash is being saturated and when the break comes this charges the condenser which discharges across the timer gap through the primary of the resonator and the induced current of high voltage set up in the secondary of the resonator passes to the plugs. Using a small resonator coil on the top of each cylinder eliminates all high-tension insulation. The timer used and which is manufactured by the company has a roller R, Fig. 18, for each of the stationary contacts which rollers are supported on stirrup pieces with spring tension in the supports pressing the roller constantly against a fiber disk D in the center of the timer and which disk revolves. In one side of this disk is a recess H and when each stationary roller contact drops, once in each revolution, into it the roller contacts with a stationary roller K carried on the cover of the timer and which roller receives the current from the primary coil on the dash.

**Albert Champion Co.**—The Champion high-tension magneto, Fig. 23, differs from many of the magnetos on the market today in that it uses a magnetic interrupter for breaking the primary current, varies the timing by an oscillating shield between the pole pieces and the armature and carries within it the entire system. The armature of the scheduled type carries a primary and also a secondary winding so that the external step-up coil is eliminated. The condenser is carried in front of the armature at the driving end and the magnetic interrupter at the rear end. The interrupter is a soft iron piece on a spring which acts upon another spring

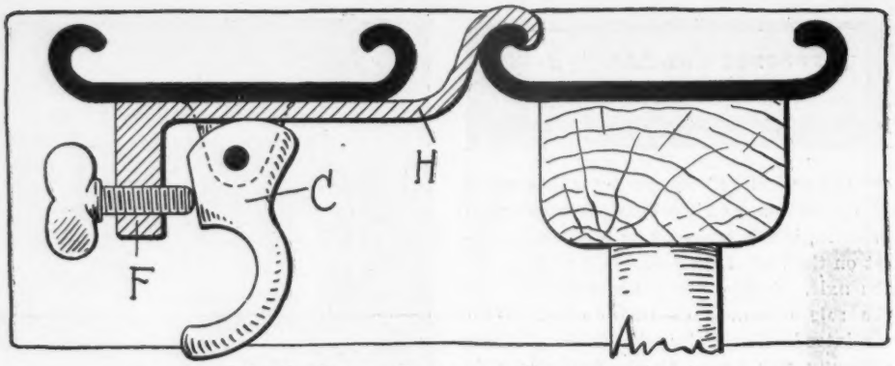
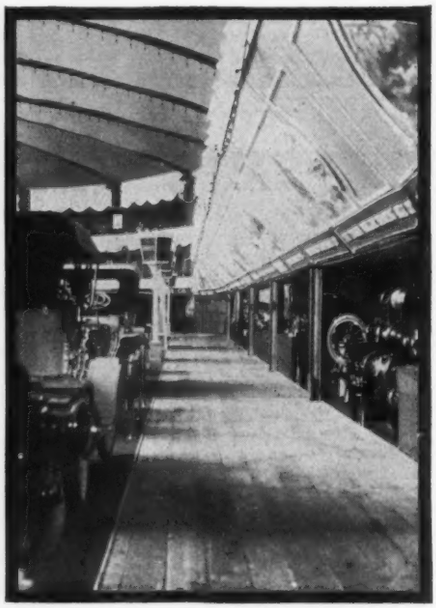
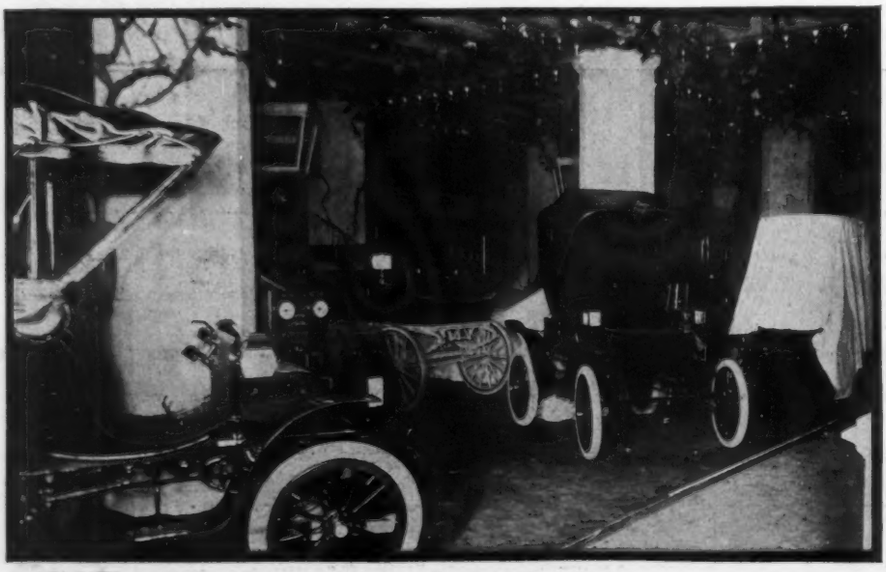


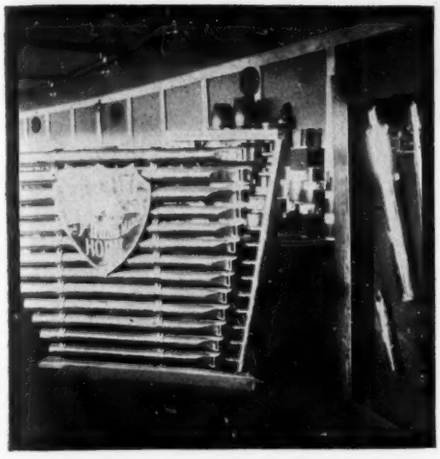

FIG. 19—DETROIT DETACHABLE EMERGENCY RIM



IN A BALCONY AISLE



STUDEBAKER ELECTRICS IN THE RESTAURANT



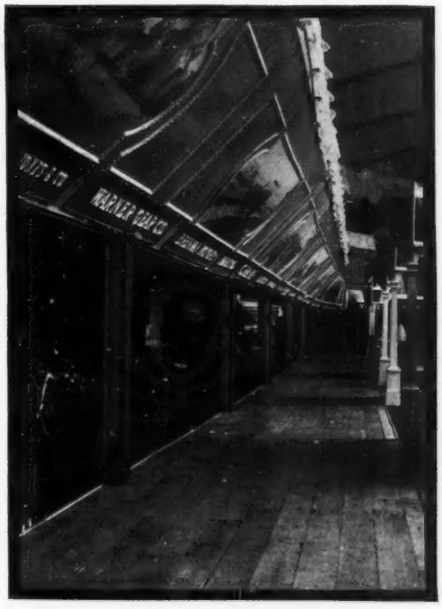
THE GIANT GABRIEL HORN

piece carrying one of the platinum points. At a certain point, namely, that of maximum current, the break takes place. The distributer is of the wipe contact type, the revolving part being a carbon brush. The current is not taken into the distributer through the cover but from a projection beneath it in which is located the safety spark gap. The magneto parts are mounted on full-race annular ball bearings and six non-drilled permanent magnets are used.

**W. D. Spring Cushion Tire**—The tire exhibited by this concern carries a regular outer casing but instead of using an air tube within it employs a system of steel springs. In the tread part of the tire is a miniature solid rubber tire fitting within a crescent shaped rubber piece. Beneath this and the rim comes two systems of springs: The first is four windings anchored in metal strips at the tire base and concaved to fit around the miniature tire solid rubber tire referred to; and the second in shape resembles a clincher rim and rests within the first mentioned spring.

**New York Sporting Goods Co.**—Two windshields are a part of the exhibit of this supply company. One termed the hydraulic is automatic in that to lower the upper half it is but necessary to lift on handles at the ends of the frame and to again raise it a pull down on these handles is sufficient. The illustration, Fig. 20, shows the upper half A and the lower half B both with brass frames and hinged together at C. Carried on the lower part is a cylinder hinged at its lower end and within it works a plunger P on the end of a rod connected with the top half. Above the plunger is a coil spring and beneath it the cylinder is filled with oil, there being a small vent hole in the piston to let the top half folds to the horizontal plane of the hinge C then the spring starts the oil through. To lower the upper half lifting on the handle H lifts the plunger P against the spring tension and so soon as plunger down again and holds the shield in the down position. The other shield, Fig. 21, is of the automatic type in which the upper half hinges to the lower at C and a spring S holds it locked in the up position, as illustrated. To lower the top half A is pulled to the left extending the spring S which extension continues until the top half is below the horizontal when the spring begins compressing and holds the shield in the down position.

**S. F. Bowser Co.**—A most striking part of the Bowser exhibit of gasoline and oil storage systems is a group of four solid brass pumps, one for gasoline, one for kerosene and two for lubricating oil. Attached to the gasoline pump is the new filter housed in a vertical brass cylinder. The gasoline entering at the top follows a spiral course in the outer part of the cylinder to the base and then rises in the



VIEW IN THE BALCONY

center through two conical shaped filters of 120 and 150 gauge mesh screens. In the bottom of the cylinder is a drip cock

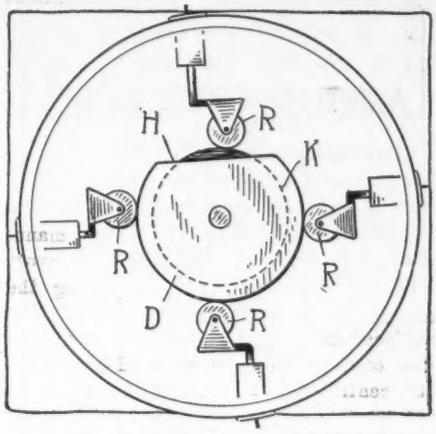
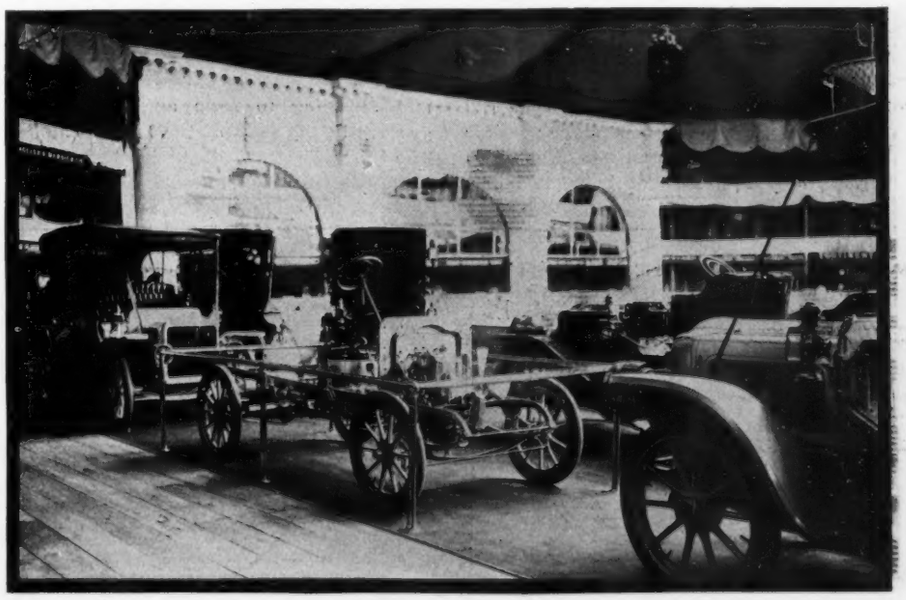



FIG. 18—HIGH FREQUENCY TIMER

for draining off any sediment that may collect. All of the pumps are fitted with the new discharge recorder which registers up to 9 gallons. The portable gasoline tank for garage use has been improved since a year ago by the addition of a handle for pulling with and also rocking feet which prevent tipping should a person sit on the regular pushing handle or place heavy weights upon it.

**Detroit Emergency Wheel**—The Detroit emergency rim, Fig. 19, is a spare rim carried on the car and having an inflated tire. Should the tire on the wheel puncture it is left on the wheel and the Detroit emergency rim fitted to the side of the clincher rim by four hooks which grip over the outer head of the clincher. The four hooks are regularly distributed at 90 degrees around the rim circumference. Two of the hooks at one side are rigid on the emergency rim, whereas the other two are adjustable, as illustrated. The hook part H fits over the wheel clincher and has a long shank lying on the emergency rim and an end flange F in which is an adjusting screw. This screw acts against a cam C which tightens the rim in place and locks it on. The cam is supported on the rim, but the



WHERE THE WHITE STEAMER HOLDS FORTH

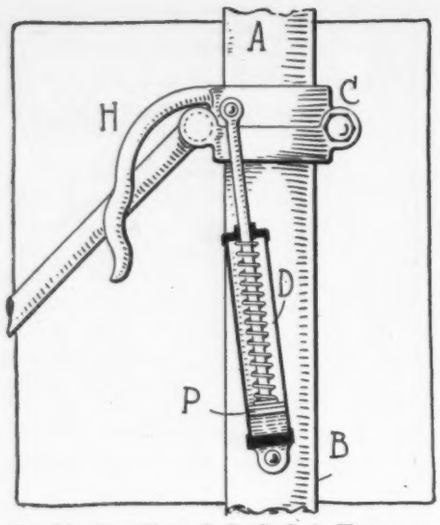



FIG. 20—NEW YORK S. P. G. CO.'S HYDRAULIC

hook H is free to slide on the wheel's rim.

**U. S. Spare Rim**—This emergency rim attached to the rim on the car wheel through four hooks which grip over the clincher bead on the outside. The hooks are regularly distributed around the rim and two are rigid and two adjustable. The adjustable hooks have a cam with handle for tightening the emergency rim in place and a pawl and ratchet device for holding the adjustment. To release the cam pressure is needed on the pawl extension only, so that the rim can be attached or detached without tools.

**Lebanon Steel Casting Co.**—This company shows crucible steel castings of almost every nature and intended for every part of motor cars. The tensile strength of these castings is said to vary between 70,000 and 120,000 pounds per square inch, and the percentage of elongation and reduction of area will vary according to the carbon contents and may run from .20 to any amount desired.

**F & S Bearings**—The F & S annular ball bearing, Fig. 22, is made in two styles designated types P and P1, the former being the old style and the latter the new one, announced by the J. S. Bretz Co. during the past autumn. The new type carries more balls on each bearing than did the old type, which has been made possible by using a two-part-die-cast separator which permits of a full race of balls, less one. The old separator was pressed steel type and consisted of halves, each having a series of semi-spherical pockets which in conjunction with corresponding pockets in the other half of the separator formed a pocket for each ball. The halves were held together by riveted screws. The new separator consists of two die-cast rings with pockets on the opposing sides for accommodating the balls. The halves are secured together by countersunk binding pieces. The carrier A is die-cast of special alloy and made in halves B and B1, in the opposing faces of which halves are semi-circular openings for containing the balls. The halves are anchored together by brass wires C of dovetail section, which are inserted in dovetailed-shaped grooves and have their ends clinched over into notches in the side of the separators. Readers of Motor Age are aware that in an annular ball bearing of this type the balls are carried between the inner and outer retaining races D and E. In the F & S bearing a characteristic feature is the method of entering the balls between these races, this method being to form angular entering grooves in the sides of the races D and E. The bearing is half filled with balls before these entering grooves are needed by placing the races D and E eccentrics to each other. When half full the remainder of the balls are entered by the angular entering grooves, which grooves are not quite so deep as the grooves D1 and E1 of the races D and E; consequently the balls are sprung in under some pressure. Once in the balls do not touch the entering grooves. In assembling a bearing the requisite number of balls are put in, after which one-half of the separator is positioned, then the other half and finally the anchoring wires for holding the halves of the separator together. At the same booth is shown the U & H magneto with its self-starting arrangement, Fig. 24, an announcement of which was made in an earlier issue. In brief the self-starter is a clutch and spring combination so that when one cranks the motor the armature of the magneto does not start, revolving for the first quarter turn of the starting crank, during which time a spring is being wound up within the magneto. At the end of the quarter turn a ball clutch releases the armature and it starts to rotate quickly in obedience to the spring, the speed of its rotation being such as to give a good spark. Once the motor starts the ball clutch is held out of action by centrifugal force working the ball into a radial slot, but as soon as the motor stops the ball drops back into place, disengaging the armatureshaft from the drive so that it is ready to start again. The clutch mechanism is set to release only when the piston has passed the top center so that all possibility of a back kick is avoided.

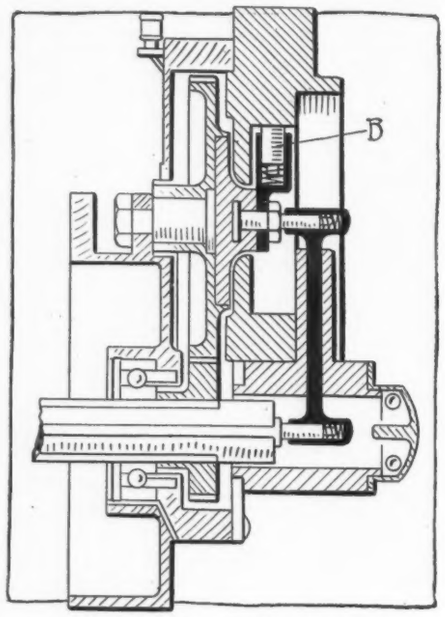



FIG. 23—SIMPILL DISTRIBUTER

**Garvin Machine Co.**—Machinery that will interest the manufacturer of motor cars is being shown by the Garvin Co., among which are its vertical spindle milling machine, designed especially for milling gear and crank cases; its plain milling machine, with an automatic slot milling attachment, and a Monitor lathe with the company's patented quick stop-and open chuck. This booth is popular with the factory men.

**Erie Foundry Co.**—The exhibit of this concern consists of cylinders for motor car engines, both machined and shown in the rough, some of them being sawed through to show the quality of iron used, the accuracy of the cores and the capacity of the waterjackets.

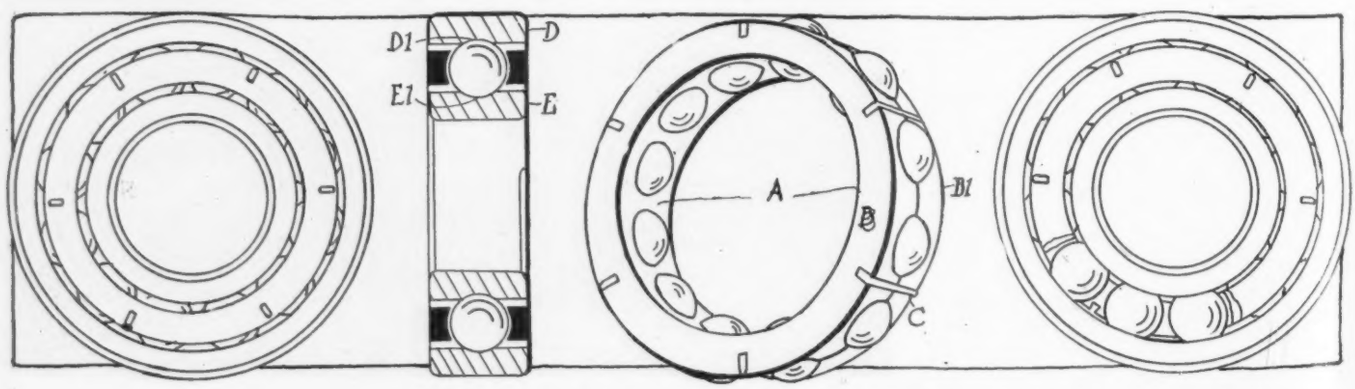



FIG. 22—SHOWING DESIGN OF THE 1909 F & S BEARINGS

## Variety of Clutches on A. L. A. M. Cars

BUYERS are asking many questions about multiple-disk clutches and the impression is general that they are easier to manipulate with less danger of injury to the clutch itself and the car parts. The makers of cone and expanding and contracting clutches are not nervous, as a capable salesman is equal to any exigency that hight arise when information on clutches is needed. The cork insert fever has vastly favored the cone clutch devotee. The line-up in the clutch situation as compared with a year ago is much the same with whatever change there has been in favor of the disks. In the new models the disk type has gained a few adherents, notably the Stearns in its town car in which the Hele-Shaw with corrugated disks is used. The Stevens-Duryea, Winton and Pope-Toledo are examples of carrying the multiple-disk clutch is a separate compartment of the gearbox and the Warner comstyle of construction. In Knox cars the cone type of a year ago has been supplanted with a three-disk type. The Chalmers-Detroit Thirty, one of the new models brought out, carries the disk clutch entirely enclosed within the gearbox compartment. The new Mathesons, Lozier and Palmer & Singer use disk clutches.

Not a few makers building several models employ different clutches in different models. As an example, take the Chalmers Thirty with disk and the Chalmers Forty with cone. Another example is the big Stearns with expanding band and the small one with disk. The Thomas, Knox and the Autocar are devotees of the three-plate clutch in which one plate attached to the shaft to the gearset is clamped between a couple of plates carried on the flywheel. While frequently styled a plate or floating ring clutch it really comes under the disk classification. The Apperson and the Haynes cars use the contracting band types; and expanding band types of one nature or another are fitted on Peerless, Packard, Stearns, E-M-F and Elmore. Cone clutches are used on all or on some of the models of the following concerns: Pierce, Studebaker, Corbin, Locomobile, Pope-Hartford, Royal Tourist, Selden, Chalmers Forty, Columbia and Walter. Cars fitted with disk clutches include such names as Lozier, Stevens, Winton, Franklin, Chalmers Thirty, Pope-Toledo, Matheson, Knox, Simplex, Palmer & Singer, Stearns, Thomas, Knox and Autocar and Cadillac model T.

The policy of interlocking the clutch with the gearset is paramount, the majority of makers having had experience with stripping gears with the clutch partly engaged or the engaging of the clutch with the gears not completely meshed. A few makers interconnect the clutch with one set of brakes whereby disengaging the clutch applies the brake, the first movement of the clutch pedal working the disengagement and the remainder applying the brake. A still further interconnection is where by the application of one set of brakes disengages the clutch. A couple of years ago cars were exhibited where the application of either set of brakes threw out the clutch, but this made starting half way up a hill an awkward problem in that the brakes had to be released before the clutch could be thrown in, which gave the car an opportunity of starting to back down before the motor took control. A few makers have arrangements whereby such interconnections can be put on without much trouble.

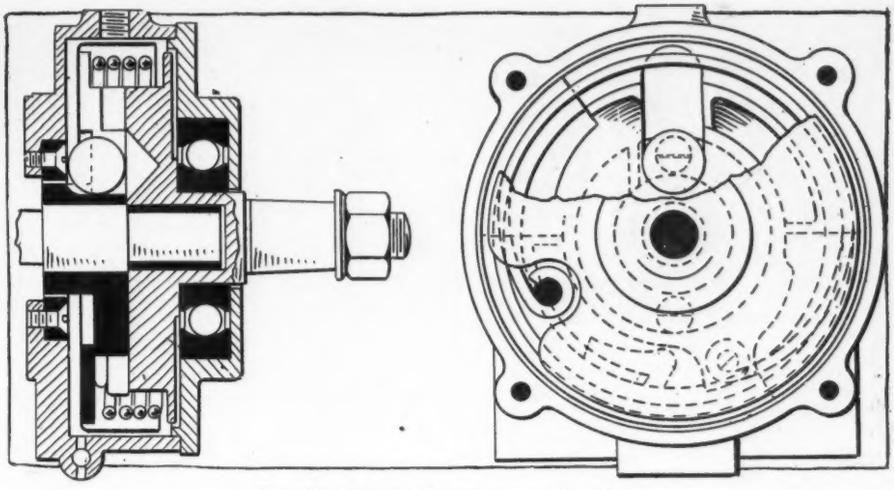


FIG. 24—THE U & H STARTING DEVICE

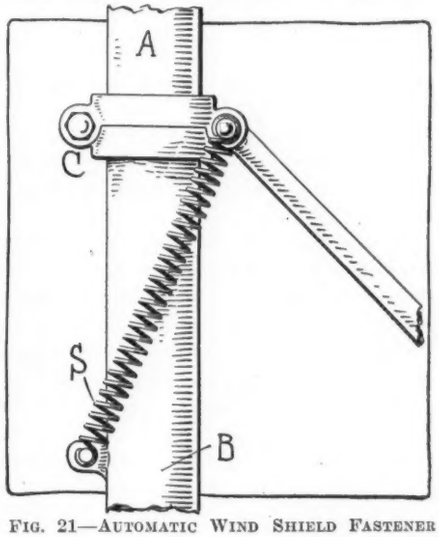



FIG. 21—AUTOMATIC WIND SHIELD FASTENER

Some who have been around the show assert that the cone is still slightly leading the multiple disk, although if all the other types are added together, the plurality leads, for there are expanding band clutches, contracting band clutches, expanding rings, three disk, and three plates.

In transmission systems, or rather speed-changing devices, the selective system leads, the progressive being second and planetary being third, while the number of speeds saam to be about equally divided between three and four.

TWO CHASSIS ARE SHOWN BY MATHESON

AMONG the Chicago dealers and branch managers noted at the show are Carl Metzger, Woods electric; A. J. Banta, Locomobile; Paul Picard, Palmer & Singer; J. Diebler, Haynes; H. Paulman and J. Lawrence, Pierce; B. G. Sykes, of Corbin, and Berne Nadall, Nadall rim.

The army of New York dealers is a large one, among which noted every day in the Garden are: R. Garden, Pierce; E. S. Partridge, Stearns; S. Bowman, Apperson; G. Bennett, White; E. Rainney, Elmore; M. J. Budlong, Packard; C. Wridgeway, Peerless; H. M. Davis, Knox; E. W. Headington, Haynes; J. P. Plummer, Locomobile; H. Haupt, Thomas; Carl Page, Chalmers-Detroit, and C. W. Matheson, Matheson.

Alexander Winton was one of the early visitors at the show, and was brimful of six-cylinder information.

Ralph Estep, in charge of the Packard exhibit, was unfortunate in having the large plate-glass mirror on which the polished chassis rested crack on the opening night.

Stearns, Lozier, Matheson and Chalmers-Detroit exhibit spaces are conspicuous by the showing of two chassis in each.

The Locomobile No. 16, which Robertson piloted to victory in the recent Vanderbilt cup race, and the Thomas Flyer of New York-Paris fame, with all of its mud and trappings, comprise one of the interesting specialties of the show.

The motor cycle exhibit in the basement is a hummer and there is talk of a separate motor cycle show for another year unless the motor cycle people get a little more consideration.

The exhibit of the mammoth 5-ton truck of the Knox company, built for the New York fire department, is the jumbo of the show and is daily surveyed with much interest.

Two-cycle Jim Becker, of Elmore fame, was early on hand Saturday and is a daily visitor.

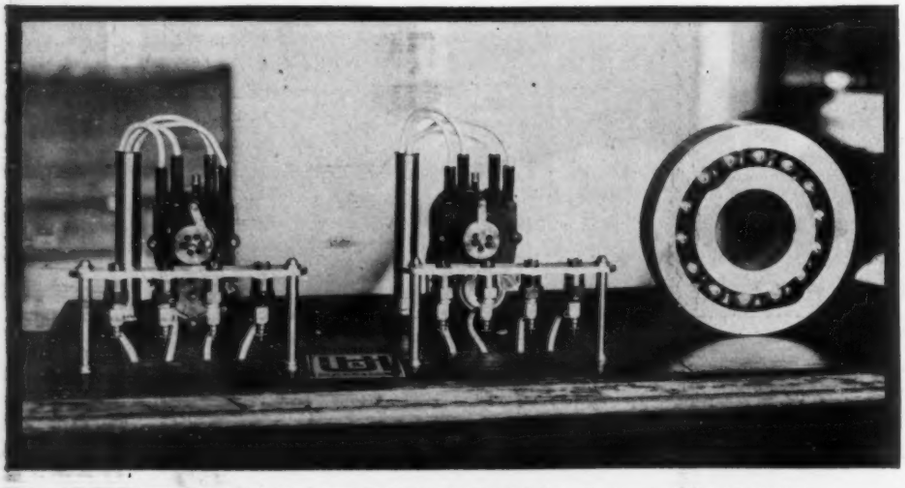
Of the designers A. L. Riker, Locomobile, was one of the earliest at the show Saturday. The Founders' week cup which Robertson won with the Locomobile at Philadelphia is a big center of attraction in the Locomobile exhibit, as is the shaft-driven model.

At the booth of the Diamond Rubber Co. is shown the silver trophy captured at the recent 1,000-mile run of the Chicago Motor Club in its tire test.

The Knox stand has a particularly large exhibit of cups and trophies won in hill-climbs and speed events by Knox cars during the past week.

Colonel Clifton, of the Pierce, brought the information to the show that the remainder of the Pierce output for this year will consist of six-cylinder cars. The Louis XVI limousine mounted on the six-60 Pierce is easily the finest finished body that has ever been exhibited at a motor car show in America.

H. A. Lozier and Sales Manager Emise were early on hand to explain the merits of the new Lozier six.



MAGNETOS AND ANNULAR BALL-BEARING MODEL AT J. S. BRETZ'S STAND

Oldsmobile, Buick, Northern and Waltham are among the old faces missed from the car department and among the newcomers are E-M-F and Palmer & Singer.

Walter, Palmer & Singer, Simplex, Haynes and Selden occupy the south balcony and Apperson, Clement-Bayard and White steamers and Woods electric the north balcony.

An improvement in the decorations could have been accomplished by raising the mural paintings so they would be visible from the main floor; as it is they are hidden by the cars exhibiting on the balcony and by the signs.

Winton and Royal Tourist are the only two makes showing self-starters.

In the present six-cylinder brigade are Pierce, Winton, Stevens, Franklin, Peerless, Lozier, Stearns, Thomas, Palmer & Singer, Apperson.

Among the make-and-break ignition exponents are Locomobile, Columbia, Studebaker and Walter racer, the Studebaker using the Bosch magnetic plug.

The Cadillac runabout is the sole single-cylinder machine at the show and the Elmore is the two-cycle exponent. To the Elmore also goes the three-cylinder record.

F. A. Babcock, Babcock electric; L. Geyler, Stevens; Fred Robie, Excelsior motor cycles; Frank Martin, Firestone tires; C. Smith, Diamond tires, and F. E. Edwards, all from Chicago, are in attendance.

Among the many tradesmen at the garden from day to day are Fred Dietz, of Dietz lamps; Elwood Haynes, Haynes; Howard Coffin, Hugh Chalmers and R. D. Chapin, of the Chalmers-Detroit; Phil Dorn, American Ball Bearing Co.; W. R. Timken, of the Timken Roller Bearing Co.; F. M. Germane, Standard Roller Bearing Co.; J. S. Bretz, with F. & S. ball bearings; Henry Hess, of Hess-Bright; P. Steenstrup, sales manager of the Hyatt Roller Bearing Co.

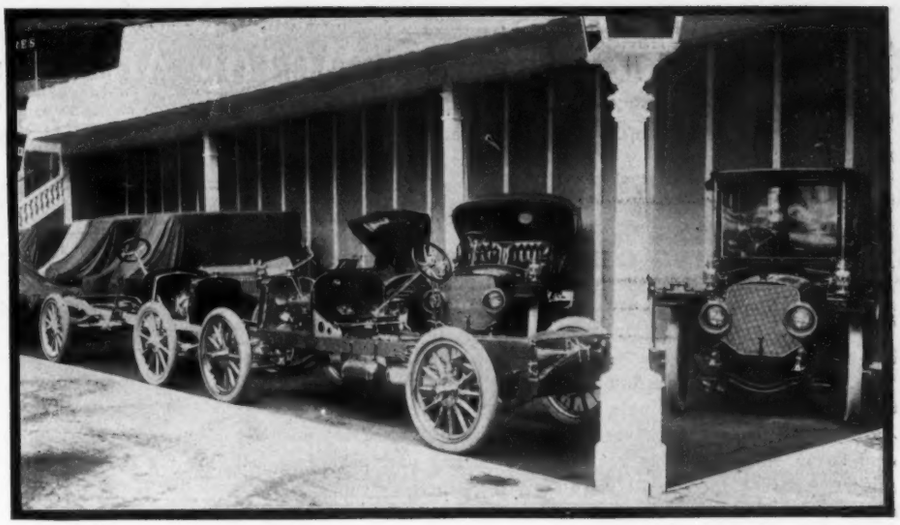
Among the men representing the tire fraternity are noted H. de Lissa, of the Ajax; J. A. Braden, of the Diamond; H. E. Raymond, of the Goodrich; H. A. Githens, of the G. & J.; H. S. Firestone, of Firestone; Ben Swinehart, of the Swinehart; Sales Manager Steidleman, of the Goodyear; L. Matlack, of the Michelin; Messrs. Fisk and Dunn, of the Fisk; J. C. West, of Morgan & Wright, and Mr. Anderson, of the Hartford.

In the varied accessories booths some of the company representatives include Messrs. Atwood and Castle, of the Atwood-Castle Co.; C. B. Smith and E. W. McGookin, Stewart speedometers; George Schebler, of carbureter fame; George Kingston, of the Kingston carbureter; S. B. Bechtel, of the Bowser storage system; George Edmunds, of E. & J. lamps; William Gray, of Gray & Davis; L. Wainwright, of the Diamond chain; W. Rands, of the Rands Mfg. Co., and T. Tomlinson, of Havoline oil.

In all twenty-two commercial cars and chassis are on exhibition, Knox, Hewitt, Sampson, Franklin and Autocar and Thomas in the gasoline field and Studebaker, Champion and General Vehicle Co. in the electric realm. The Knox exhibit specializes in two big fire department wagons, one for the New York fire department and designed for carrying lengths of hose and with a central mounting for supporting the hose when in use; the Thomas vehicles are a landaulet taxicab and a victoria; the Franklin line as shown embraces a stake truck, a delivery wagon and a town car; the Autocar company has a delivery wagon and a chassis; the Sampson presents a big four-cylinder truck and the Hewitt shows an immense four-cylinder truck with twin Kelly-Springfield tires on front and rear, in addition to which is a two-cylinder truck.

In the electric commercial end are Studebaker with stake, delivery and express models, General Vehicle Co. with varied types and the Champion.

The electric vehicle pleasure exhibit is in the restaurant off the right of the main entrance, with the exception of the Woods exhibit, which is located on the balcony in the main hall with the gasoline cars. All told there are forty-two electric pleasure cars on hand, six of which number are chassis. The restaurant is crowded with Studebaker and Baker in the center within the aisle and Waverley, Columbia, Rausch & Lang, Bailey, Detroit and Babcock around the three walls of the square restaurant space.



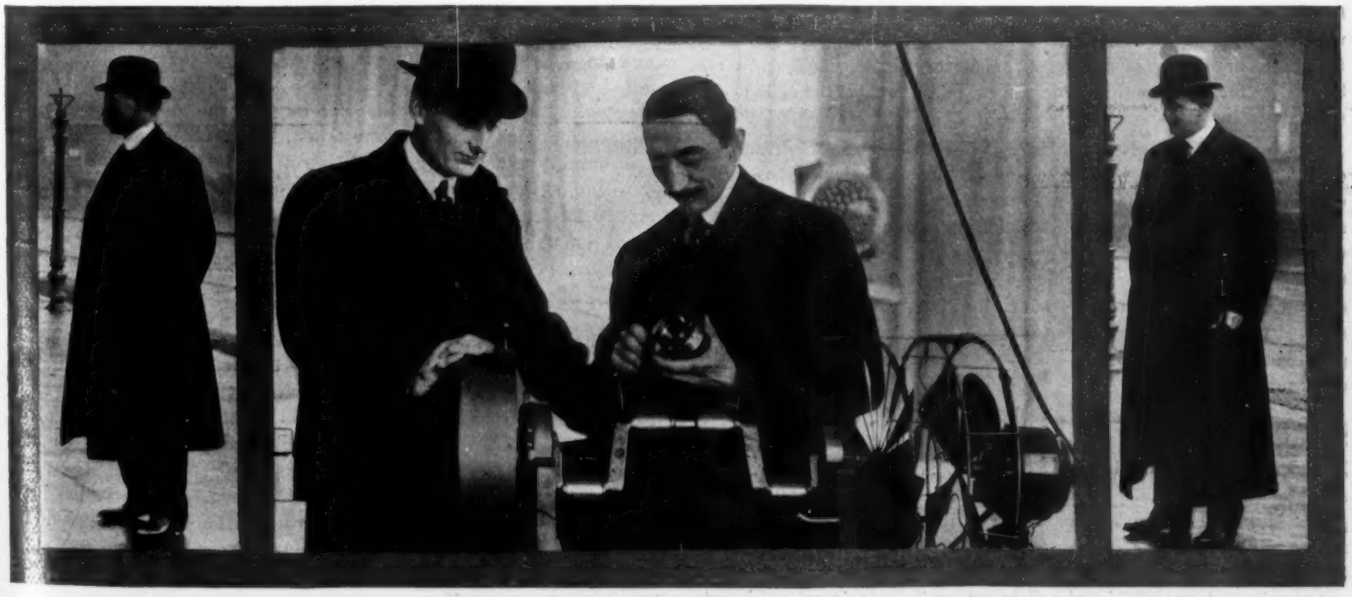
WHERE THE LOZIER IS ENCAMPED

The enclosed electric vehicle is everywhere apparent and the tendency toward runabout types with an imitation forward bonnet and steering wheel is most pronounced. The colors are more brilliant than heretofore, the Babcock showing a neat vehicle in light color with victoria hood to match. Other vehicles are in brilliant colors. A point that attracts is the number of electric chassis on exhibition.

In the basement motor cycles occupy a good share of the space, there being in all thirty firms exhibiting and upward of 150 machines of one type or another on the floor, ranging from the four-cylinder shaft-driven types to the small single-cylinder chain-driven designs. The adaptation of motor cycles for light commercial uses is not so strong as noted at former shows.

Perhaps the most attractive part of the motor cycle exhibit is the cross aisle of the basement with the little two-wheelers ranged on supports at either side; the remainder of the exhibit is around the east end of the basement.

Everywhere the accessory exhibits are brimming with life. These exhibits are, roughly speaking, in three places; namely, in the galleries surrounding the main hall, in the concert hall over the electric vehicles and in a part of the west end of the basement. There has been a certain amount of aim toward segregation, but it could have been carried to a much greater degree of perfection. An example of segregation is the grouping of many of the tire men on the balcony end above the main entrance and the majority of them are located at one point or another on the balcony floor. The remainder of the accessory exhibits are scattered on the second or third galleries, in the concert hall or in the basement.



R[illegible]E OF THE MARMON

COFFIN OF THE STANDARD ROLLER BEARING CO.

HICKOK III OF HARRISBURG

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# Impressions Gained From Madison Square Garden Show

CHANGE and decay are attributes of terrestrial life: One design giving way to another drops into oblivion and is gone and one set of brains brings to completion its life conception, consumes the little flame and steps aside to let younger and stronger minds take the helm. So is it in the broad, fierce contest of life, so is it in the divers departments of industrial pursuits and so in the motor car realm. All designs and designers, all makes, whether good or ill, play their part in the structure being reared; some take permanent places, occupying niches in the halls of motoring fame, while others are passing shadows whose influence is felt while they are present but which vanishes as soon as they depart. So with makes of cars—some are history—builders, others are but present day conveniences.

★ ★ ★

CHANGE is a healthy condition in life: The stalwart athlete realizes that to get into the best condition there must be a continual wearing out of muscular tissue and a building of new, in fact, this is the basic principle of strength and health. The decaying tissues must be immediately carried away and food-laden blood rushed to that center to rebuild. In a new industry the same rules hold good, each year brings a new load of changes and it is expected that for several years yet in the motor car field this load will be an annual visitor. Of the twenty-nine makes of gasoline cars exhibited in the garden amphitheater fifteen makes show few changes during the past year, some of the types being shown practically as a year ago except for a few inches added to the wheelbase achieved by offsetting the front springs so that the axle is directly beneath the radiator. In some cases uncontrollable conditions have been the dictators, whereas in others the companies have been content to sit and look on.

★ ★ ★

IT would be most desirable if the industry had progressed to that point where change is undesirable, but it would appear from the many reports of engineers who have been carefully studying the conditions in other lands that the end is not yet and that the predictions of those who declared that the annual model is a thing of the past, is not due for a few seasons more. Until the efficiency of the gasoline motor is increased there will be room for change and there are many other unsettled constructions in the show.

★ ★ ★

SEVERAL makers who have not deemed it desirable to change the basic or secondary construction of their machines have seen fit to bring out smaller editions in response to the country-wide demand for smaller and lower-priced vehicles. Instead of the smaller model being a duplicate of the larger, several concerns have retained many of their original features and introduced several new ones. Such changes are generally healthy conditions, providing they are not launched on the market before well tried out and proved.

★ ★ ★

AMERICAN makers should guard against the pitfalls that several European builders fell into, namely, that of carrying too many eggs in one basket. Putting the whole dozen in one place is good commercially, but at times public demands and commercial principles are at variance and it would appear best to keep the ear well tuned to the cry of the people and not be too much tied up within the factory walls. It is one thing to build a car and another problem to market it; the constructing is internal, with the factory the selling external. Many French builders pinned everything to the big car, barnacled the sporting end to favor such and tried every device to carry their end, but public opinion won out. In France the small car has succeeded. The reputation of many French builders was made on the big cars and the big races but those same big cars and big races killed them. Time changes conditions and the thoughts in men's minds and the factories should have a corps of experts with wireless telephones listening to the whisperings of the futures as they may be discerned from the present.

★ ★ ★

THE most approved automatic and multiple factory machinery will not retain, in the mind of the public, the demand for a certain type of car or specific construction that the designer considers the be-all and end-all, in fact, the acme of engineering skill; annual shows will fail in dictating to an eager public what it does not want; the best factory organization will eventually lose out if not meeting the great demands of the people; and while commercially considered a certain line of manufacture is correct according to the basic principle of political economy, yet the public judges and takes generally what it wants.

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BUT the gasoline car is only one part of the industry, there are the electric pleasure cars, electric commercial cars, gasoline commercial cars, motor cycles, and the great army of parts and accessories which are so important. Electric machines are in the go-ahead state, the makers have realized the rapidly growing market for them and fortunately are specially designing them for winter as well as summer use. The makers also are entering the roadster field by bringing out cars with good mileage and suitable for the around town work of the business man. In the commercial field recognition has been taken of the light-goods merchant who has loads less than 500 pounds weight to deliver and also of the big wholesaler or manufacturer who wants vehicles to move ponderous loads of 5 or more tons. The intermediate field has not been neglected. A healthy indication in this field is that the maker is assuming the role of dictator and to a pretty good extent telling the buyer what he should get instead of allowing the buyer to dictate as to what he wanted. In the days when the buyer, who did not know the motor from the gearset in the truck, was dictator and the maker the humble second, the condition was the same as a cowboy ordering delicate shades of china. Now this is changing, the maker has studied what the buyer wants and the buyer has got sense enough to accept under good conviction what the maker considers best for his particular conditions.

★ ★ ★

IN the motor cycle field the makers have shown wisdom by accepting the advances made by builders of the gasoline car and have not wasted months and years with what have proven to be poor constructions in conjunction with hydro-carbon motors. This commendable wisdom will rush the motor cycle industry ahead in a year or so on a sound base. The big accessory army has not been idle during the year just closed. Ignition men have been bringing out improved devices and others have been adding new ones to their list. The tire men made a big price reduction and in many cases increased the quality of tires. Carbureter, lamp, bearing, windshield, wrench and the vast army of other makers have gone ahead in an amazing manner.

# Details of the New Motor Speedway Planned by the Hoosiers

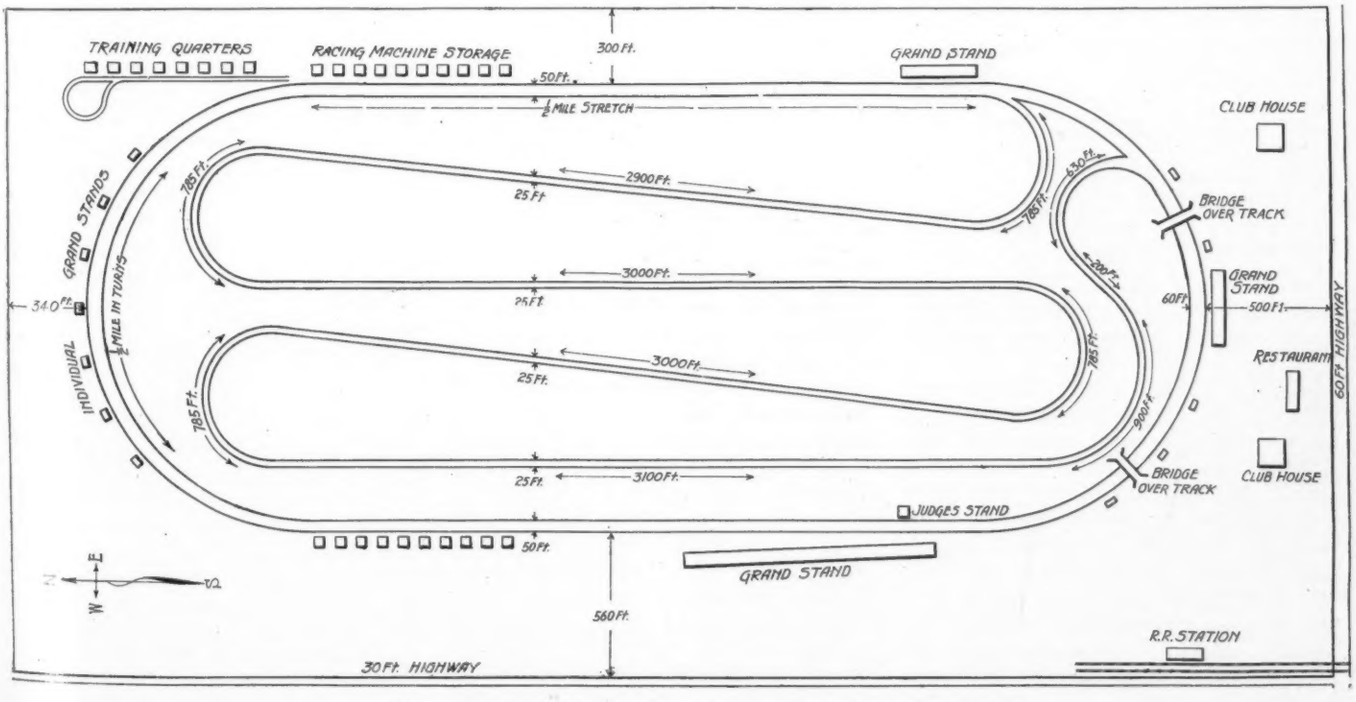
INDIANAPOLIS, IND., Jan. 19—Detailed plans for the motor speedway which is to be built near Indianapolis were announced today. The speedway has a 2-mile circular outside track 50 feet wide, with 60 feet on the curves, banked suitably for a speed of 100 miles per hour. Also there is a 3-mile inside road-racing course in connection with the outside track, which can be used when wanted for this combination style of road and track racing. The inside road course is 25 feet wide in the straights and 35 feet wide on the turns, well banked, and the turns will stand an average speed of 60 to 65 miles per hour. The complete outside and inner track measures 5 miles 3 feet from the pole line. The entire plat of ground is 1½ miles long and ½ mile wide, and contains 320 acres of ground.

The object of the motor speedway company is to furnish suitable track and road facilities for the driving and testing of American cars for long-distance or high-speed contests, and to have a suitable track and road course where these tests and trials can be made at any time of the year such trials are necessary; also to furnish suitable grounds and quarters for outdoor shows and meetings of motor car engineers, manufacturers or dealers. The grounds are conveniently located on a flat plateau 3½ miles northwest of the center of Indianapolis, and is connected by 1 mile of improved road with the elaborate boulevard system of the city. The New York Central railroad passes the southwest corner of the ground, and will have a 2,000-foot switch on the ground with an unloading platform and railroad station.

There will be three main grand stands with seating capacity of 35,000, and twenty individual grand stands placed at convenient locations about the track, each of these grand stands raised 10 feet from the ground and having accommodations for fifty persons, making it convenient for clubs to attend in a body and have their grand stand for their own members, and raised high enough so that they can all command a view of the entire track. This is entirely level. There will be no fences or buildings closer than 50 feet to either the outer track or inside roadway. The track will be so constructed that it will graduate off to the level ground, except where the turns are banked, and these will be so graduated back to the level as to insure every possible precaution for the safety of drivers and spectators. The parking spaces and grand stands will be subdivided from the main grounds by 8 feet wire fences, making it impossible for spectators to get onto the track.

One clubhouse on the grounds will be headquarters of the Indianapolis Motor Car Club. Another clubhouse will be devoted for the uses of officers and contestants. An eating-house and cafe will be installed suitable to take care of all requirements. The 2-mile course will be provided with lighting facilities of 420 independent electric arc lights, provided with reflectors.

A great deal of preliminary work, had been done, and at this writing a force of engineers are staking out the track and buildings and active work by a large force of men will commence not later than February 15. The track and entire grounds are under contract to be completed by May 15, and it is the expectation of the management to hold the first public event early in June. An immediate effort will be made to secure the national stock chassis race of 1909, and the motor speedway company will immediately take steps to affiliate with the American Automobile Association and see if this important event cannot be the opening at the Indianapolis speedway. A bid will also be made to have one international contest for the benefit of the west each year, and with this end in view, the Wheeler & Schebler cup has been subscribed. This cup will be made by Tiffany, of New York, and the actual coin value of this cup will exceed $5,000. Another valuable trophy has been given by the Prest-O-Lite Co. for contests of light car class.




PLAN OF MOTOR SPEEDWAY TO BE CONSTRUCTED BY INDIANAPOLIS TRADESMEN

# Rules for Sixth Annual A. A. A. Tour Announced By Hower

NEW YORK, Jan. 19—Chairman Hower, of the A. A. A. contest committee, today made public the rules that will govern the Glidden tour this year. Several radical changes are noted and provision is made for the toy tonneau class, for which a third trophy will be offered. The dates are not announced, nor the route. The rules are as follows:

The sixth annual reliability touring contest of the American Automobile Association will be held..... to .....1909, starting at ..... and ending at .....

In connection therewith will be offered for competition certain trophies and certificates, described as follows:

1—For touring cars, the Charles J. Glidden trophy.

2—For miniature tonneau and double-rumble cars, the .....

3—For touring runabouts, the Frank B. Hower trophy.

4—For all cars completing the run as contestants, certificates.

1—The trophy in each class shall be awarded to the entrant whose car completes the contest with the fewest points to its debit. A certificate will be awarded to each contestant who finishes the run under the rules.

### Qualifications

1—Each entrant shall be a member of a club affiliated with the American Automobile Association.

2—Any stock car consisting of a combination of the manufacturers standard touring car chassis, touring body and standard equipment, with seats for four people or more, and carrying four or more persons or ballast at the rate of 125 pounds per person, may compete for the Glidden trophy.

3—Any regular stock chassis with body equipped for two persons on the front seat and with standard equipment, and carrying not less than two persons, may compete for the Hower trophy. The car may have a rumble seat for one or two persons and additional passengers may be carried.

4—Any stock car, consisting of a combination of a miniature tonneau with doors, mounted upon the chassis regularly furnished with same and standard equipment, carrying four persons or ballast at the rate of 125 pounds per person, may compete for the ..... trophy.

5—Cars shall at all times during the tour carry mufflers and mud-guards, and be fully equipped as per manufacturer's catalog specifications, except that tops and wind shields need not be carried.

6—Shock absorbers and spring wrappings may be added before the start as equipment, though not regularly furnished.

### Responsibility of Entrants

1—Each entrant by his signature to the entry blank shall agree that he is familiar with the rules, that he will abide thereby and accept the official records, and authorize the American Automobile Association to publish them in such manner as it shall determine.

2—Each entrant shall hold the American Automobile Association harmless and indemnify it against all loss or damage resulting directly or indirectly from or growing out of the operation, management, or control of the car entered by him.

3—The American Automobile Association shall not be responsible for any damage that may be done to any car, its passengers or contents during the tour, nor for the theft of any car or any of its accessories or contents, the same being at all times subsequent to such entry, and until the close of the tour, at the risk in all respects of persons entering same.

4—Each entrant or his official representative shall be responsible for the acts of passengers in his car.

5—Each competing car must be delivered into the custody of the committee before 9 o'clock on the morning of .....1909, for official examination and to check the inventories of parts and tools carried hereinafter provided for.

6—Each entrant shall name an official representative for each of his entries, on or before July 1st, 1909, failing which the driver of the car shall be considered the official representative.

7—The official representative of the entrant shall be subject to all rules and penalties prescribed for the entrant, and shall be considered as the entrant in fact.

### Entries

1—The time for receiving entries shall expire on June 16th, 1909, at 12 o'clock noon at the office of Frank B. Hower, chairman, contest board, at 760 Main street, Buffalo, N. Y. Each entry must be accompanied by the entrance fee. For entries received prior to May 15th the fee shall be $200; after May 15th and until 12 o'clock noon on June 16th the entrance fee shall be $300.

2—Each entrant shall give all details asked for in the entry blank and such additional information as the contest committee may from time to time require.

3—The contest committee of the American Automobile Association reserves the right to refuse any entry.

4—Entries shall be numbered in the order of their receipt.

### The Route and Schedule

1—This information will be supplied later. The route will be marked with confetti.

### Pacemaker

Each day's tour will be preceded by a pacemaker's car; and any entrant or representative thereof who passes the pacemaker shall be disqualified. If the pacemaker's car breaks down or is compelled to travel at a rate of speed so slow as to impede the progress of the tour, his flag shall be transferred to the first car overtaking him, which car shall thereafter become pacemaker's car subject to the same conditions.

### Class Schedule

Competing cars shall be divided into classes as follows:

Class A—Cars listed at $3,751 and upwards.

Class B—Cars listed at $2,451 to $3,750 inclusive.

Class C—Cars listed at $1,751 to $2,450 inclusive.

Class D—Cars listed at $1,000 to $1,750 inclusive.

Class E—Cars listed at $999 and under.

### Daily Running Time

1—The class A running time for each day shall be posted on the bulletin board at headquarters the previous evening. Each driver, using this as a basis, shall figure his own running time and when due at controls.

When the daily running time shall be 9 hours or more the running time of

Class B will exceed that of class A 20 minutes.

Class C will exceed that of class A 40 minutes.

Class D will exceed that of class A 60 minutes.

Class E will exceed that of class A 80 minutes.

When the daily running time shall be greater than 7½ hours and less than 9 hours the running time of

Class B will exceed that of class A 15 minutes.

Class C will exceed that of class A 30 minutes.

Class D will exceed that of class A 45 minutes.

Class E will exceed that of class A 60 minutes.

When the daily running time shall be 7½ hours or less the running time of

Class B will exceed that of class A 10 minutes.

Class C will exceed that of class A 20 minutes.

Class D will exceed that of class A 30 minutes.

Class E will exceed that of class A 40 minutes.

### Tools, Parts, Replacements and Repairs

1—Each entrant shall furnish prior to the start an inventory of all parts carried in his car, and these shall be officially checked, sealed and record made of same, and charged for when used. Each entrant must furnish the manufacturer's price of each part carried.

2—All tools carried shall be listed by the entrant and officially checked prior to the start. Tools include wrenches, hammers, screw-drivers, etc., and not the small accessories frequently included in tool kits, such as emery, wire, solder, etc., which are parts or material and must be sealed.

3—Each entrant may carry as many tires, rims and tire chains and the parts which secure them in place as desired.

### Tire Repairs

There shall be no penalty for tire repairs, provided the engine be kept running while the repairs are made and no other work done. The time consumed in making tire repairs, while the engine is running, shall be added to the day's running time.

### Controls

1—Each contestant shall be ready to check out at 7 o'clock each morning. Checkers shall be at their stations at that time prepared to start the cars.

2—Each entrant, or official representative of such entrant, upon starting each day's run, shall sign a statement submitted by an official of the tour fixing the time of his departure, and shall be given a card, indicating such time. Failure to comply shall result in disqualification.

3—The committee may establish such checking points as it may deem proper.

4—A car ahead of time at night controls may immediately check in.

5—There shall be established at the close of each day's run a parking station, in which all competing cars shall be stored. The station shall be in charge of the chief observer.

6—Each car shall be checked on arrival at the control.

7—Following the registration at each night control, each car shall be delivered into the custody of the officials of the tour to be by them held at owner's risk, and kept under direct charge and supervision of such officials or their agents until the time for starting on the following morning, but after registering, the car may deliver the occupants (other than the driver and observer) and baggage, at hotel, and then immediately proceed to the parking station.

8—Passengers and baggage may be taken on at the parking station after the car has been delivered over to the observer and driver before checking out in the morning, or at the hotel after checking out, but no time shall be allowed.

### Intermediate Checking Stations

Checking station will be inaugurated in so far as it is necessary to stop racing. Each driver shall receive a card when checking out in the morning which shall name checking stations, so that he can estimate his running time during the entire day. There shall be no appeal from the time registered by the various official watches.

### Observers

1—Each entrant shall furnish at his own expense one official observer for each car entered by him; all observers shall be acceptable to the committee and subject to its instructions. If the entrant is a motor car manufacturer or dealer, or in any way connected with the manufacture or sale of motor cars, each observer furnished by him shall be

(a) A person who has been regularly and exclusively employed by the entrant by whom he is nominated for a period of not less than 3 months immediately prior to the contest, or

(b) The entrant himself or an officer or director of his business, or

(c) A dealer in the car made by the entrant;

(d) An owner of a car made by the entrant.

2—If the entrant is not a motor car manufacturer or dealer, the observer furnished by him shall be satisfactory to the committee.

3—Each observer may be assigned to a different car each day.

4—The committee shall be empowered to

suspend any observer who neglects, is incompetent, or for any other reason fails to fulfil the duties assigned to him, and to provide a suitable substitute at the expense of the entrant, by whom suspended observer was nominated.

5—It shall be the duty of each observer under all conditions and without evasion of this rule for any reason whatsoever, to remain with the car until he has been relieved by the chief observer and to report every detail of the performance of the car to which he is assigned, and all persons who operate, repair, assist or perform any action connected therewith.

6—Observers must not advise drivers as to the rules, but in case of a tire repair when the engine is running he shall sign and hand to the driver a printed form on which is filled in the time used and see that the time is added to the running time.

7—After the car is parked the observer shall present his record for inspection to the driver of the car on which he has ridden and obtain the driver's signature thereto. The record shall then be immediately delivered to the chief observer; the driver, the observer and other occupants of the car shall leave the parking station only when released by the chief observer.

8—In the event of sickness or an accident to an observer which shall make it an impossibility for him to remain with the car, or secure a substitute properly authorized, he shall select one of the passengers of the car as a substitute observer, who shall perform all of the duties pertaining to the position and shall, in addition thereto, have his record signed by all the occupants of the car during the time he is on duty.

9—Should any objection be made by the driver to the record, a report may be made immediately to the chairman, who, in the event of a dispute as to facts, may require the driver to state his objections in writing. The record may also be inspected by one other properly authorized representative of the entrant, who shall also have a right to register an objection and submit proof in support thereof.

10—The observer shall ride in the seat assigned him by the entrant or driver.

11—When any work, whether under penalty or non-penalty conditions, is being done on different parts of the car, making it impossible for the observer to properly watch each operation, the observer may compel one of the workmen to stop until such time as he can properly watch him.

**Penalties**

1—All cars start with clean score.
2—Penalties shall be imposed for:
(a) Late arrival at night control.
(b) Repairs and replacements.
(c) Deterioration as shown by final examination under published schedule.

3—After an allowance of 2 minutes, each late arrival will be penalized one point for each minute or part thereof.

4—Parts, labor and use of tools shall be penalized as follows:

Inventoried parts and material carried from the start: One-tenth of a point for each 10 cents or fraction thereof.

Time consumed by driver and mechanician in work in connection with such parts. One-tenth of a point for each man working for each minute or fraction thereof.

Outside labor: Two-tenths of a point for each man working for each minute or fraction thereof.

Parts and material not inventoried and carried from the start: Two-tenths of a point for each 10 cents or fraction thereof.

Time consumed in connection with such uninventoried parts: Two-tenths of a point for each minute or fraction thereof for each person.

For the use by driver or mechanician of tools not listed: Two-tenths of a point for each man for each minute or fraction thereof that such tools are in use.

5—When a number of parts are used at the same time, each part shall be separately penalized. Example: If a bolt and nut are used together, each will be recorded and penalized as a separate part.

6—Any car which may, for any reason, discontinue as a contestant, shall be penalized 1,000 points in addition to all previous penalizations.

7—In recording time to be penalized, the operator of the car and the observer must mutually agree as to the time when work commences, which shall be immediately recorded on observer's card, and as to the time when such work ceases, which shall also be immediately recorded.

**Road Regulations**

1—Entrants and official representatives of entrants shall conform to all laws, ordinances and rules of the road, and any entrant or official representative of such entrant violating any of the provisions of these rules, or of other rules adopted by the committee, or who shall fail to show due consideration to the officials or other participants in the tour or other users of the highways, may be disqualified.

2—Any car whose owner or driver shall be arrested for a violation of speed laws, or of any law or ordinance, may be disqualified.

3—When road conditions are so bad that a car cannot get sufficient traction to move, or is ditched, and reasonable effort has been made to extricate it, towing or other external means may be used to relieve the immediate distress only, but under no circumstances shall a car enter a night or any other control, except under its own power. When towing, or assistance from any external source shall have been received by a car, its observer shall make a full and complete report, giving time, place, conditions, distance of tow, and any other details.

4—Each car shall have its official number prominently displayed on each side of the hood, and, if possible, painted on radiator in front.

5—No record of any previous performance, or sign, or special indication of the maker's name, other than a nameplate on the front of the radiator, shall be displayed on any car at any time during the tour.

6—All replacements, replenishments, adjustments, or repairs can be done only on the daily running time.

7—The tools listed may be used by the operator and by the mechanician without penalty, but must be done on the running time.

**Protests; Disqualification**

1—A written protest may be filed with the committee, by any participant in the tour, but must be accompanied by the sum of $25. If the protest is not sustained this sum will be retained by the American Automobile Association, but if the protest is sustained, the protest fee will be returned to the person making such deposit. No protest except conforming to the above requirements will be considered. Each protest will be acted upon at the earliest practicable moment.

(a) Any protests as to unfair rulings, routes, etc., shall be made within 12 hours after the occurrence.

(b) Any other protests shall be made during or immediately after the tour is concluded, and before any award is made.

2—No entrant, or his official representative, shall be disqualified until he shall have been notified of the act complained of, and if the act be denied, he shall be given a hearing, after which a decision shall be rendered. Upon notice of such disqualification, he shall cease to run in the contest, the official numbers shall be removed from his car, and such entrant shall not receive any certificate, but shall be mentioned in the records as having been disqualified, and no entrant of any car that may be disqualified shall have any claim of any kind or nature whatsoever against the American Automobile Association or any member or members of any committee or any official of the tour, because of such disqualification, or the publication thereof, or failure to mention the performance of the disqualified car prior to its disqualification.

3—Contestants who withdraw may, in the discretion of the committee, continue on the tour as "non-contestants."

**Powers of Committee of Contest Board**

1—The committee of the contest board shall manage the tour, with full power to enforce the rules, render decisions and do anything else that would be within the province of the contest board of the American Automobile Association.

2—The committee of the contest board reserves the right to alter, amend or suspend these rules from time to time, up to and including the end of the tour and final award, as may in its judgment be deemed expedient.

3—The committee or its representatives shall have power at all times to make such examinations of the cars and their contents as may be deemed advisable.

4—The committee shall have power to disqualify any car for traveling at any speed which it may consider excessive under the conditions existing at the time, and without reference to these rules.

**General**

Entrants, drivers and observers shall consult the bulletin board at headquarters each night for additional information; failure to do so will be at their risk.

**Hotel Accommodations**

Hotel arrangements will be under the management of competent hotel men who have had large experiences in rooming guests at conventions and other gatherings. These men will take complete charge of the rooming at each night's stop. The committee particularly requests that no individual hotel reservations be made in advance. No preference will be shown in selection of rooms.

**Baggage**

Each contestant must take care of and handle such baggage as he and his guests may need.

# Cleveland Promises $21,000,000 Car Output in 1909

Cleveland, O., Jan. 18—With the production of something over $21,000,000 worth of motor cars staring them in the face, Cleveland factories are swinging into the the new year with every confidence in the future. Not for many, many months have local motor car builders been willing to keep their factories going full blast, but all that is now changed. The Winton, White, Stearns, Peerless, Royal, Gaeth, Baker, Rauch & Lang and Byrider factories are all hard at it, employing close to 5,000 men, while in one or two cases the shops are running overtime—in marked contrast to a year ago. A close and conservative estimate of the total value of the cars to be produced in this city before the close of the season is $21,500,000—a figure which may or may not be influenced one way or the other during the coming twelve-month. Cleveland, unlike Detroit, is not a city of myriad factories, nor is it able to claim any record for the total number of cars produced. Cleveland is proud of one fact, though—more high grade cars are produced here than in any other city in the country, it is claimed. Cleveland is not the home of low-priced motor cars, the cheapest, aside from electrics, sells for $2,000. The electrics are much lower in price, averaging about $1,700. So it is easily seen that the Cleveland output is very high grade and although not more than 5,000 high-powered cars will be built this year, they will command a high figure.

Despite the financially light year, considerable building was done by the local factories, something over $200,000 being expended. A goodly portion of this was spent by the Peerless Motor Car Co., for its new buildings have been pushed rapidly. Stearns and White also did considerable work, the latter concern pushing the new factory through to completion, while the Stearns people have been steadily adding, not only to the factory, but to the office buildings as well. The only real blow which ever blackened the record of the motor car factories in Cleveland—the Royal failure—has been handsomely overcome, and the new Royal Tourist Car Co. is starting out well.

# Asphalt and Macadam Suggested For a Country Road

WASHINGTON, D. C., Jan. 19—A new kind of country road—a combination of asphalt and macadam—was proposed to the independent Asphalt Association at its annual meeting, in the New Willard hotel, today. The innovation was suggested by Amzi L. Barber, who has spent most of his life in the asphalt business. A macadam highway, with a strip of asphalt in the middle, he said, was the hope of the future, the only highway to stand the heavier loads and the ever-increasing motor traffic. In the course of his address Mr. Barber quoted government statistics to show how large a proportion of the country's wealth was produced by farmers, and what a small share of the government appropriations, comparatively, was devoted to their interests. Largely on account of the unimproved state of the roads, he said, the mere hauling to markets and to shipping points costs the farmers of the country $662,000,000 every year.

The speaker reviewed the progress of the good-roads movement in recent years, and advocated extensive government aid.

"It is only a question of time," he said, "until such appropriations will be made. They are as necessary for good roads as for rivers and harbors, or for postoffices. The farmer has the same right to demand quick delivery, which is possible only over a good road, that the city man has to demand fast mail trains and frequent delivery by city carriers."

In approaching the problem of road construction, Mr. Barber sketched the advances made since John Loudon Macadam, a century ago, devised the kind of road which still bears his name. The macadam road, admirable as it is, has been found unable to stand against the wear and tear incident to modern vehicles, modern loads and modern speed. Mr. Barber said in part:

"Inasmuch as macadam and asphalt by long evolution, the first for 100 years, and the last for nearly 40 years, have established themselves in many countries as the premier types of roads, I have, after long and careful consideration, come to the conclusion that the best, if not the only solution of our problem, is a combination of the two in the form of an asphalt strip of suitable width, running through, and usually in the middle of the macadam.

"Horses can be driven on the macadam as now, if desired. Motor cars, when the road is clear, will have an ideal surface in the middle, equal to a billiard table, with no ruts or lumps to look out for. When motor cars meet, they will slow down and turn out so as to run upon the macadam only on one side and for a few feet; and when rain first falls on the asphalt, making it slippery, they can run with one side on the pavement and one side on the macadam, to avoid skidding. When on the strip of pavement in the middle they will cause neither dust nor wear.

"Finally, and if no other advantage were to be gained, farmers can haul on the asphalt more than double the load that they can haul on macadam. This consideration alone should decide the matter in favor of the asphalt strip."

Mr. Barber spoke of the damage caused to the smooth surface of roads by motor cars and of the increasing seriousness of this damage.

"Statistics in former years show that farmers' wives provided a greater percentage of insanity than any other class. The introduction of the telephone and the rural free delivery have in some measure tended to remove the essential isolation and monotony which were considered the chief cause of the insanity. Motor cars and good roads will furnish complete remedies for these two handicaps to farm life.

"There are in the United States 225,000 miles of railroads, and 2,151,570 miles of public roads, only about 8 per cent of the latter being improved. For every mile of railroad there are about 9 miles of dirt and 1 mile of good stone road."

Taking the average cost of making a 16-foot macadam roadway as $10,000 per mile, Mr. Barber estimated the total cost of a 16-foot road with a 6-foot strip of asphalt in the middle at about $13,000 a mile, an increase of 30 per cent.

"This asphalt strip," he said, "should last for from 15 to 20 years, or longer. It will successfully overcome the old difficulties and avoid causing any new ones."

## RULES ON RAILROAD TARIFF

Washington, D. C., Jan. 15—Considerable interest attaches to a decision rendered by the interstate commerce commission in the case of J. A. Whitcomb against the Chicago and Northwestern Railway Co. and others, which was decided adversely to the complainant. The complaint was that the rate of 92 cents per 100 pounds, with minimum weight of 5,000 pounds, charged by defendants for transporting an uncrated motor car from Beatrice, Neb., to Kenosha, Wis., was unreasonable, and reparation was claimed for the amount in excess of what complainant claims would have been a reasonable rate on the car, weighing 725 pounds, and at the rate named. The defendants answered that the rate charged was according to the published tariff and that it was just and reasonable. The tariffs apply the following rates on motor cars: "Not boxed or crated, double first-class at actual weight, subject to a minimum of 5,000 pounds each at first-class. Boxed or crated, one and one-half times first-class at actual weight." Applying this rate on the car in question, the charge was upon a minimum of 5,000 pounds at the first-class rate of 92 cents, or $46. The complainant claimed, and it was undisputed, that the agent at Beatrice informed him that if the car was not crated or boxed it would be charged at the rate of $1.84 per 100 pounds—double first-class—on the actual weight. In this he was mistaken. The lawful published rate was charged, and the only question for determination was whether the rate is unreasonable.

## POPE DEAL COMPLETED

Toledo, O., Jan. 16—As was anticipated, there was no opposition on the part of creditors of the Pope Motor Car Co. to the confirmation of the sale of the local properties of the concern to the Toledo Motor Co., recently incorporated for the purpose, under the laws of Ohio, and the deal was this week perfected in the United States court here. Judge Taylor directed that Receivers A. L. Pope, G. A. Yule and F. A. Scott pay to the creditors the full amount of their claims, less the accrued interest, whereupon they will be discharged from further connection with the affair. As the only consideration named for the purchase of the properties is that the Toledo Motor Co. shall assume the debts of the old concern, the court ordered that there be no delay in settling with creditors. Judge Taylor took occasion to commend the efforts of the receivers very highly, saying: "The creditors of the old company are saved a tremendous loss by this disposition of the receivership. What promised to be a protracted and expensive litigation is thus ended and creditors will receive the whole principal of their claims, sacrificing only the accrued interest." Negotiations for the sale of the local properties to R. D. Apperson, of Lynchburg, Va., were declared off at a conference of the interested parties in New York, the latter maintaining that the price asked for the plant was too high, and it is said that it will be continued and developed under the management of Harold Pope. "We propose to go right ahead and put the plant back on a capacity basis as soon as possible," said Manager Pope this week.

## ORMOND DATES SET

New York, Jan. 18—The seventh annual Florida beach races will be run on the famous sand course March 23 to 26, inclusive. It was left to the enterprising little town of Daytona, a few miles from Ormond, on the east coast, to say whether the races should lapse this year or not.

Daytona said "No" most emphatically, providing the tournament be given on Daytona beach, where the world's records have been made. Frederick Dutton Stidham was sent to Daytona to take charge of the raising of the funds for the seventh annual meet, and was received enthusiastically by the Florida East Coast Automobile Association's officials, and made such good progress that the funds asked for were soon assured. There will be radical changes in the conduct of the races in March.

### BOSTON'S BIG FIRE

Boston, Mass., Jan. 17—The biggest fire in motor car history in this country, perhaps, started here early this morning and when it was finally put out there were perhaps 300 motor cars burned up. All that remains of them is a lot of twisted iron that may sell for old junk. The loss may be placed at perhaps $700,000. The fire was in the heart of the motor district downtown. It started in a long, narrow building that had been used as a railroad freight shed several years ago, but when the N. Y., N. H. and H. moved to the south terminal it was given up and since has been occupied by motor car repair shops. One garage there stored 200 cars. As it was Sunday there were few employes on hand and these had close calls to get out, for the flames seemed to sweep both ways at once and soon the place was a roaring mass of flames. One big limousine was gotten out, but all the other cars in the garage and the ones stored in the repair shops were destroyed. The Rambler occupied a large part of the building and there were forty-four of its cars in the shed, none of which could be reached. Frank E. Wing had three of his Marmons there and they were burned. He had removed his show cars to his store on Columbus avenue Saturday night and thereby saved them. On the other hand, C. F. Whitney, agent for the Berliet and Stoddard-Dayton cars, had his salesroom floor varnished Saturday and so he had placed all his machines in the old building over Sunday and they were lost. Fred Smith, agent for the Apperson, Autocar and Oakland cars, also stored his cars there, and he lost about fifteen machines. J. W. Maguire had his repair shop there for Pierce-Arrows until a short time ago, when he moved, so he was saved from loss. The Concord Motor Car Co. lost a number of cars. Many of the big sight-seeing cars used in Boston were stored there and these went with the rest. As the record books were burned up it was impossible to get any adequate idea of the number of machines lost by individual owners, but it is known that there were many large high-priced makes in the garage belonging to prominent persons. Had the fire crossed to Columbus avenue it would have taken in the Ford branch, also the B. F. Goodrich Tire Co. and the Linscott place, where Reo, National and Overland cars are sold.

## Plan Uniform Show Decorations For Next Paris Salon

PARIS, Jan. 4—If another Paris salon is held, it is almost certain that the scheme of uniform decorations such as prevail in the American shows and which was originated by Sam Miles for his Chicago Coliseum affair several years ago, will prevail. That the French promoters have about decided upon this was demonstrated to the satisfaction of the Motor Age correspondent who visited the recent Paris salon. By chance he had with him a copy of the last Chicago show number of Motor Age and before he got out of the building he engaged in conversation with a member of the show staff to whom he showed Motor Age. Glancing through the issue and catching sight of the illustrations of the uniform decorations, this director declared:

"I suppose you have heard it is the intention of many of the leading manufacturers to refrain from taking part in the salon of 1909 unless the expense in connection with the show is cut down considerably. The idea is gaining strong ground that we should have a show along the American lines; that is, uniform decorations for everybody, and in fact all of the show work or stand erection work to be done by the show management. Those who have and yet complain about the present system of the richer the concern the richer the stand and its appearance are the smaller firms, and some of the larger ones that have not been any too successful in recent years. Houses like Renault, de Dion, Delaunay-Belleville, Aries, de Dietrich and others do not care because they have plenty of capital, do a constantly increasing business and are willing to spend fortunes in order to have the finest looking stand at the salon. On the other hand, the business done at the salon does not any more compare with that done in former years. Then the agents really used to close their contracts and many prospective buyers waited for the salon to give their orders there. Today the agencies are taken care of long before the salon opens and very few do their retail buying at the show. It is now a social affair, a spectacle for the masses, but from a business point of view it could be dispensed with, anyhow every other year.

"I may assure you that New York friends of Mr. Rives and of other members of the Paris show committee have been requested to give all possible information about the organization of this year's American shows and that they will also furnish all possible data which will enable us here in Paris to get a good idea of the American show idea. I feel quite sure that the next salon de Paris will be copied or modeled according to the American shows."

The Chicago 1907 show issue of Motor Age was then laid upon the table and the Frenchman, without the asking, said at the sight of the views of the main floor and of the stands, "That's the idea. It's an excellent one." Just then there passed two directors, of the de Dion-Bouton company. The show official called them and both of the newcomers, after looking at the Chicago show views, expressed their opinion that it was the only way to arrange a motor car show of national importance.

### WISCONSIN ROAD SCHEME

Milwaukee, Wis., Jan. 18—Northern Wisconsin is demanding a comprehensive good roads program from the Wisconsin legislature now in session. Senator A. W. Sanborn of Ashland, Wis., will introduce a bill giving the northermost tier of counties a third of the money required to build highways, the county and abutting property owners standing a third of the expense each. He would have the state furnish all specifications and plans, and all crushed stone, transportation prepaid. The growing use of the motor car in the territory once a dense forest, and still in some sections a forest primeval, has created a demand for good roads. Owners in the north fear that the southern part of the state, of which Milwuakee is the practical center, will get all the benefit to be derived under the new good roads amendment to the Wisconsin state constitution, and plead that although the population in the north is not so dense as in the south, the very fact that the north is a new country is argument enough that the roads there should be improved first.

### MOTOR CARS FOR TAFT

Washington, D. C., Jan. 18—Upon the intimation of President-elect Taft that he would like to begin his administration with motor cars in the White House stables instead of horses the committee on appropriations, in the house of representatives, has included in the urgent deficiency bill an item of $12,000 for the purchase and maintenance of motor cars for the executive mansion. There is little question but that the item will be enacted into a law, thus making the first instance in the history of the country where congress has made a direct appropriation for the purchase of motor cars for the president of the United States.

# Motor Car Situation in Europe Through Yankee Eyes

NEW YORK, Jan. 18—Howard E. Coffin, chairman of the A. L. A. M. committee on tests, who has just returned from the foreign show, has made the following report on the results of his trip:

"The designer's impressions, to be gained at the '09 shows of London and Paris, must of necessity be flavored with some disappointment. In some instances so little change was to be found over the models of the previous year, that the same catalogs were used without change of either text or illustration. An explanation advanced by one exhibitor was that his product having arrived at absolute perfection, it was obviously unnecessary to change his catalog—an answer perhaps not altogether in accordance with the reports of overcrowded stock rooms and overproduction.

"In a few instances decided improvements in detail, in accessibility and in progress of design were to be seen. As a case in point, a clean-cut small four-cylinder car, in which all parts likely, under normal conditions, to need the attention of the operator, could be dissembled and reassembled by hand without a tool, is worthy of mention. But in many cases, almost in retrograde, a departure was to be noted from the clean-cut construction of former years; and seemingly unnecessary parts and complications were introduced. Rumor has it and observation and figures would seem to bear out that the state of the foreign market is not such as to encourage progress and the development of new features.

**Low-Priced Cars Popular**

"As has been said many times in the press, the small car easily led the field in point of public interest and in number of sales. Scarcely a maker that has not announced a low-priced, medium-powered car of either one, two or four cylinders for 1909. A few small sixes were in evidence. Such concerns as Fiat, Delahaye, Martini, Lancia, Clement, Hotchkiss, Delaunay-Belleville, Darracq and a dozen others, exhibited small cars of excellence. Almost without exception, the motors of these cars had cylinders of *en bloc* construction. Both two and three-bearing crankshafts were in evidence; also the use of annular ball and plain bearings upon the crankshafts. One well-known foreign engineer has stated that above a 4-inch bore it is not advisable to employ annular ball bearings for crankshaft work. Below this figure such sizes of ball bearings can be adopted, structurally and commercially, as to give perfect satisfaction. Hence the discarding of the use of annular ball bearings upon some of the larger motors such as Mercedes and Hotchkiss, and the adoption and retention of such bearings upon motors of smaller sizes. Even among the small sixes and larger fours, there were to be seen examples of *en bloc* cylinders, notably the Delaunay-Belleville, Deasey and several others.

**Study in Spring Suspension**

"In spring suspension, the three-quarter-elliptic rear with the usual one-half-elliptic front reigned supreme on all new models; and almost universal attention was shown to the proper lubrication of the eye-and-shackle-bolts. Pressed steel frames are generally heavier than used in America. Axles worthy of mention were the Lancia pressed steel front and the Fiat pressed steel rear casing. Other axle, radius-rod, torque-rod and structural details generally were as frequent and variegated as the number of cars of the exhibitors. One car such as the Hotchkiss, of acknowledged reputation and worth, shows a rear construction, in which all torque and car-driving strains are absorbed directly by the rear springs, whose front ends are anchored rigidly against the frame. Perhaps as a next door neighbor would be found a car of equal reputation but equipped with radius-rod, torque-rod or tube, possibly two of them, and all the paraphernalia in any way excusable in such a connection.

"The transmission problem would seem little changed, except perhaps for a tendency toward the progressive type on the smaller cars, retaining the selective for the larger models. Clutches, as before, are cone, multiple disk, contracting and expanding band, metal-to-metal, leather-to-metal and maverick. Certainly the simple cone type is at least holding its own.

"Reverting to the small car matters as being of considerable immediate interest to American constructors, upon the face of it, taking into account the extremely high speeds made in recent foreign small car races, it would appear that there exists abroad some magical touch of design, materials or construction, far in advance of anything American. The real facts, however, are not by any means so discouraging. In the first place we must remember that the character of European small car contests has been very different from anything over here. Here, except in the case of the last Savannah event, every effort has been put forward to limit the contesting cars to a construction at least approximately in accordance with the regular stock product of the manufacturer entering. Even at Savannah, where leeway was given the maker along lines of special construction, insufficient time was allowed between the dates of the announcement and the running of the event, to permit of the design, construction and test of any special racing car. It must be remembered further in connection with this event, that for 6 or 8 weeks the organization controlling 90 per cent of the contests throughout this country was holding over the head of each individual manufacturer the threat of disqualification should he permit a car to be entered.

"Glance for a moment at the Savannah result: A foreign car of a make perhaps acknowledged abroad to be the equal of any car there built—this particular car, a special one, built for racing, lightened even to the extreme extent of a frame drilled full of holes, fresh from tests and trials in England, and sent here in perfect condition in ample time to work out over the course. This car in a distance of 196 miles and a total elapsed time of 3 hours 43 minutes 33 seconds, gained a total of 6 minutes 12 seconds over its nearest competitor, an American stock chassis, and 10 minutes 22 seconds over its next competitor, also an American stock chassis. It is a matter of record how much delay from tire and other trouble was experienced during the race by the three cars. The behavior of the other foreign cars is also a matter of record.

"It is conceded that the winning car ran a beautiful race. It must also be conceded that the American cars finishing second and third were both faster than the winner, and that their delays were occasioned by insufficient or improper preparation, in one case at least the third. It must also be considered that to make the third car eligible in the event it was necessary to reduce the bore of the cylinders; which was done without in any way lightening the stock chassis to keep pace with this reduction of power, all of which must have very materially affected the result. However, this car made the fastest lap—56 miles per hour—was in better running condition at the end of the run than at the beginning and was immediately entered in other events in the south without the least overhauling. The race was a fair one and was closely contested, the result being in doubt almost to the finish. A little bad luck with tires—and the result might have been different.

"A good car well driven won the race. But because this car happened to be a

foreign car, it is the height of folly to conclude that all foreign stock small cars are superior to the similar product of America. The study of foreign small-car events will show that fully as many cars go down and out owing to troubles, minor and major, as in any similar American contest. I do not refer particularly to races but to contests of all characters. As to the construction of the small cars with which phenomenal speed has been developed abroad, the car that was booked to win the 4-inch race on the Isle of Man had, of course, a 4-inch bore but an 8-inch stroke. An accident, chargeable to the great speed of this machine, put it out of the running. Other cars have even longer strokes, for instance the single-cylinder one which averaged better than 65 miles per hour for 100 miles on the Brooklands track, was of 4-inch bore and 10-inch stroke.

**Rules Not Obeyed**

"One of the rules under which American contests have been run during the past year, has been that the entrant must stand ready to sell the entry at the end of the race for the regular price of the stock model of which the car entered is supposed to be a duplicate. It is interesting, as illustrating a far removal from stock properties, that the car last mentioned—there were three of them built—was quoted for sale at a figure in thousands that did not fall far short of the price of the real stock article in hundreds.

"These special speed machines are admittedly impossible for stock models. Cars of this freak construction will run just as fast and can be constructed just as easily in America as elsewhere, but piston speeds of from 3,300 to 3,500 feet per minute, the employment of special oils for lubrication, and valves that are nearly as large as the cylinder itself, are not factors that can enter into the healthy growth of the stock gas engine for general public utility. Even the makers of these machines shrug their shoulders at the suggestion of such a thing. Extreme vibration, high compressions, lubricating difficulties and a hundred and one other factors render unfit for public use a single-cylinder engine of 4-inch bore and 10-inch stroke, for which an output of over 30 horsepower can be claimed.

**Material and Workmanship**

"The matters of material and workmanship do not enter into this equation at all. We have the finest workmen in the world in America. They are not merely machines perfected in the performance of certain labor, but have the advantage of the knowledge that a lively exercise of their brains will be appreciated by their employers. Nowhere in Europe can be found the suggestion box or any other of the several systems common to American shop practice, and through which is added to the mutual benefit of the employe and the employer the advantage of the observant eye and the active brain of the man behind the bench.

"We have seen in the past much money spent by those allied with foreign interests, on the theory that even if the American manufacturer knew what material was right and proper, which was doubtful, and even if he did have this knowledge and chose to use it, which was beyond belief, that he would still be met by the insurmountable difficulty of not being able to get in America the proper metals. Admit, if you like, that in years past, there may have been ground for such statements. It is only natural that in countries such as France, where the motor car first saw commercial progress, that the question of materials should have received early attention. But the above noted theory is now an exploded one. It is my experience that for the season 1909, the American maker knows more in a minute about the quality of the steel in his product than the continental manufacturer does in an hour. Abroad, experiments and tests are made until a grade of material is found that will endure in the place it is desired to use it. This sample is then O. K.'d and the steel maker is asked to furnish material according to it. The French designer does not pretend to know the properties, the peculiarities or the chemical analysis of this material; he merely knows that it does his work. The American engineer and frequently the American purchasing agent, must have in his hands all data, physical, chemical and commercial, before an order for any certain material is placed. Whatever may have been the conditions in the past, it is with the present and the future that we have to deal; and the American motor car constructor has ready at hand and subject to call, in this country the equal, if not the superiors, of any of the metals of the world. It is not in keeping with the spirit of American supremacy, that the employment of such materials should be deliberately avoided by our motor car builders.

**Americans at a Disadvantage**

"In the big car classes, the American car has been at a disadvantage in that road racing here has never to any extent occupied the attention of the manufacturers, the American makers, generally speaking, being content to enter the stock chassis of the current year's model against the specially-built foreign racing cars, driven almost invariably by men retained on yearly salary for this purpose alone, and whose experience should make them blush to take candy from a baby—by defeating the American drivers and cars put up against them.

"In saying this, I do not reflect upon the nerve and good intentions of the American driver or the excellent American racing car; they have thriven phenomenally considering conditions here, and proven their surpassing merit in some international large car contests. With the right racing regulations, a large number of splendid, fast American racers would be built and their performance prove the mettle of the American designer in a more impressive and conclusive manner than ever before.

"The point I make is that the foreign driver and the foreign racing car have been produced in an atmosphere that never has and never will exist fully in this country of stock car events and hustling production which throttle the idea of special racing car construction as demoralizing and poisonous to the manufacturing end. In truly stock car events and particularly in small car racing the story in America will surely be satisfactory henceforth. In this newer development, we start in the game at least on a par generally with our foreign competitors, in excellence of machines and with the advantage of business and manufacturing methods that are far in advance of theirs.

**The European Proposition**

"Not only in methods and traditions is the foreign manufacturer handicapped, but he is confronted by the equally or even more serious problem of a market. The European countries open to him are small, some of them bankrupt, and certainly all of them, where roads and financial conditions offer some promise, well able to meet the entire demand of Europe from their own factories, at any rate if worked upon the scale possible in America. Therefore, with a few exceptions, the foreign maker cannot produce such quantities as will allow him to realize upon his cheaper labor—less than half the cost of similar American labor—or upon his cheaper materials. As a result many of the greatest and best known foreign factories are either practically closed down or are operating under such conditions of decreased production, or variegated production, that they are losing money every day. Reports of new loans negotiated and of impending failures are table-talk in Paris, the hub of the continental industry.

"The necessity behind the present attack upon our customs tariff is as clear as day to anyone familiar with this situation. Our present tariff protects the motor car as well as other similar industries of the United States, from the unfair competition of European labor, whose recompense is based upon conditions of life such as no American workman would tolerate and which, God willing, may never be forced upon him by a removal of ample tariff protection. Even our present tariff rate would not be sufficient, were American business and manufacturing methods possible abroad. The machine tools of the United States are conceded to be easily the finest in the world, but all advantage in this respect is lost through the almost complete equipment of every foreign factory with the very latest of this product of American brains."

# The Readers' Clearing House

**EDITOR'S NOTE**—In this department Motor Age answers free of charge questions regarding motor problems and invites a discussion of pertinent subjects. Correspondence is solicited from subscribers and others.

## AGE OF SPECIALIZATION

SOUTH BEND, IND.—Editor Motor Age—In a close study of the wonderful growth of the motor car industry for the year just closed, no feature is more noticeable than the specialization idea which has been forced upon the manufacturer by the discriminating buying public. Our concern long has been accustomed to making horse-drawn vehicles of various ideas for diversified purposes, ranging from the useful laundry wagon to the luxurious landaulet, but we did not appreciate to what point the motor car buyer is discriminating until we received our specification books for the past year. Now we comprehend that the word "motor car" has almost as many definitions as the term "vehicle." In keeping pace with the demand for individual need, the Studebaker motor car department has overtaken the plan of specialization which has made our vehicle business the most comprehensive in the world. In both the pleasure and commercial phases of this department this specialization is borne out. In pleasure vehicles the thoughtful buyer no longer contents himself with one car for all purposes. He has learned that it is neither wise nor economical to drive his big touring car through the congested shopping districts, and purchases an easily controlled electric or short wheelbase car for that purpose. The electric carriage, too, has become the pride of the woman of society, who utilizes this type for calling and shopping purposes to a greater extent than ever before. Not alone is this true in the east, but is equally noticeable now in Denver, Des Moines, Galveston and cities throughout the west and south. In gasoline cars there is a specific call for limousines for winter use which few makers have anticipated closely enough to keep pace with the demand. In this phase, too, there is a degree of luxury manifested in the whim of the buyer which taxes the ingenuity of the designer. Never before in the history of the industry have so many individualities been expressed in distinctive cars, and the tendency is toward still further luxury of appointment. With cars of the roadster type there is a prevailing demand for novelty in design and striking types to attract the eye of buyers who are satisfied only with the unusual. The electric vehicle offers wide opportunity for individuality of appointment and splendid opportunity for display of characteristic taste, and being in such popular favor, much time and thought of the manufacturer is devoted to this specialty. As yet the commercial department of the industry has not reached its apex, but we are receiving commendations every day from satisfied users of electric trucks and delivery wagons. Here again our ingenuity is taxed to meet the demands of various concerns manufacturing all kinds of commodities. Some of the requirements are somewhat unique, as for instance, during the past month a request came from a Denver pie-making concern for a body to hold six pies side by side. We have arranged to satisfy the pie-maker as we have the piano mover, the dry goods dealer and the ice delivery concern, but truly this is the period of specialization of motor cars in this country. —George Studebaker.

## VALVES-IN-HEAD MOTOR

Oklahoma City, Okla.—Editor Motor Age—Will Motor Age kindly state, through the Readers' Clearing House, whether the valves in the head of a motor, worked by means of rocker arms, have a tendency to wear on one side, necessitating re-grinding oftener than valves located in side pockets with direct lift, owing to the circular movement of the rocker arm? Does Motor Age consider the valves in the head type of motor the most efficient and economical for a certain power output? Is not the motor with a longer stroke than the diameter of the bore the most efficient and economical for hill-climbing and speed ability? How much graphite should be used in the crankcase of a four-cylinder 30-horsepower motor, and in the gearcase of the same car? Is it advisable to use it in the differential and bevel gears of a shaft-driven car? What is the A. L. A. M. rating of a motor 4¾ by 5¼ and one 5 by 4¾ and how is the formula figured? —Kingdom H. Morse.

The valves-in-head motor with a rocker arm operating device should not need to have the valves ground oftener than the T or L-shaped motors. The angle at which the valves are set, and the length of the rocker arm are such that there is nearly a straight push on the valve stem. If there was any wear anywhere, it would be in the valve guide and not on the seat. The fact that nearly all foreign manufacturers of racing cars adopt the valves-in-head motor for racing would indicate more power from such design. The trend of construction rather favors the long-stroke motor. A teaspoonful of flake graphite to each pint of oil is recommended for crankcase lubrication. Graphite made with grease or oil is a good lubricant for any part of a motor car. You do not state the number of cylinders for desired horsepower rating. The A. L. A. M. formula is diameter squared, multiplied by number of cylinder, divided by 2.5 which will give the horsepower of your car.

## DETROIT IS BIG CENTER

Brookville, Ind.—Editor Motor Age—The article in a recent issue of Motor Age regarding the number of motor cars turned out in Detroit was very interesting notwithstanding you left out two very live motor car towns near Detroit—Jackson and Flint. The above mentioned article on Detroit leads me to suggest that Detroit has not only the largest output of motor cars, but is really the center of nine-tenths of the motor cars made, as you can readily see by drawing a ring 500 miles in diameter, with Detroit as the center. You will observe that it takes in Buffalo on the east, Indianapolis on the southwest, Kenosha on the west, with Grand Rapids and Flint on the north. This circle would embrace such well known motor car centers as Cleveland, Toledo, Dayton and Columbus, O.; Anderson, Kokomo, South Bend, and Indianapolis, Ind.; Detroit, Pontiac, Lansing, Jackson, Grand Rapids, and Flint, Mich., and many smaller towns within the circle. Therefore, as the 1909 estimate is placed at 100,000 cars, with Detroit producing one-half of them, I think the middle west, as outlined in the circle, produces fully nine-tenths of the cars made in this country. Hurrah for the middle west. Let us all boost for it and its cars, not forgetting to also boost for good roads.—W. D. Bradt.

## FEED MORE GASOLINE

Denison, Ia.—Editor Motor Age—I have a model K. Winton, and as I am unable to obtain satisfactory results I have taken off the old carbureter, together with all the air pipings, and put on a 1908 Schebler ½-inch, as recommended by the Schebler company. I used the same intake piping but extended it lower in order to get gravity as required by the Schebler company. When the motor is cold I can hardly start it; then, again, it will go the first turn of crank. The motor hits regularly and pulls well as long as the speed of the engine does not get over 400 or 500 revolutions; then it will miss, and the faster it goes the more it misses. I have looked for leaks of all kinds, looked over the timer and everything I can think of, but to no avail; therefore, I have come to the conclusion it is in the valve spring, although I have tried 12 to 30-ounce springs. Will Motor Age also tell

me the best method of installing a Schebler carbureter on my car, which has the air control carbureter and throttle. What part of the air system should be left on, if any, and what weight valve spring should be used and what should be done with the air holes in the cap on the valves and the air holes in the valve blocks?—A. F. Bolyan.

The missing is due to not enough gasoline on high speeds. This can be overcome by turning the screwdriver adjustment on the throttle arm so that the pointer is towards 3, which will result in greater lift of the needle valve with an open throttle. Should this not prove sufficient to prevent the missing, increase the tension on the auxiliary air valve so that it calls for a greater pull to open this valve, which will result in a stronger pull on the gasoline and nozzle, thereby giving a greater fuel supply. The best place to obtain complete information on the fitting of a Schebler carbureter to a model K Winton is from Wheeler & Schebler, Indianapolis.

### USES MAGNETO ON ROADSTER

Clinton, Ill.—Editor Motor Age—Will Motor Age please state, through the Readers' Clearing House, whether or not it is practicable to attach a magneto to a two-cylinder roadster, and if, in your opinion, it is not, give reason why?—Subscriber.

It is quite practical to attach a magneto to a two-cylinder motor, providing a space for the magneto convenient to the cam gears can be found. There are two-cylinder motors so equipped now on the market. The general position adopted is on top of the crankcase, where it is conveniently driven and can be readily attached.

### TWO-CYLINDER MOTOR RATING

Anderson, Ind.—Editor Motor Age—Will Motor Age give us the rating of an air-cooled two-cylinder horizontal opposed engine with a cylinder bore of 4 inches and 4 1/16-inch stroke.—A. C. M. Co.

The A. L. A. M. method of rating horsepower is diameter squared, multiplied by the number of cylinders and divided by 2.5.

$$\text{Horsepower}—D^2 \times N = 2.5.$$

This would give a horsepower of 12.8 for a two-cylinder motor of this size.

### THE FRANKLIN EXHAUST

Denver, Colo.—Editor Motor Age—I have been particularly interested in reading the Readers' Clearing House columns, and I wish Motor Age would explain in these pages in detail the workings of the Franklin auxiliary exhaust.—I. F. Downer.

The Franklin auxiliary exhaust is a mechanically-operated valve at the lower part of the cylinder or just above the piston at its lowest point of travel. The valve is of the poppet type enclosed in a valve cage on the side of the cylinder and opened by direct lift from the camshaft. This valve opens before the end of the explosion stroke and permits the cylinder to partially scavenge before the exhaust stroke commences. The exhaust pipe from this auxiliary valve leads to the muffler, but the exhaust pipe from the regular exhaust valve leads to the atmosphere where it discharges quietly.

### CORRECTS ERRORS

Lima, Ohio—Editor Motor Age—Referring to the description of the two-cycle engine that was published in Motor Age, December 17, page 22. I find some errors in the description as follows: The downward stroke of the piston B should be piston D. A little further down, it says that the air fins are on the sides of the jacket. It should say, the fins are on the outside of the combustion chamber B. Jacket C should read, cylinder C. Pump L should read oil cup F. The upward stroke of D does not force to the throttle valve H, but to the crosshead E.—Charles M. Leech.

### ALSO BUILDS COMET CAR

Jersey City, N. J.—Editor Motor Age—In the Readers' Clearing House, December 24 issue, M. A. Stiver, Walnut, Ill., asked where the Comet motor car is made, to which inquiry Motor Age stated this car is manufactured by the Hall Auto Repair Co., San Francisco, Cal. It may be of interest to Mr. Stiver, as well as to other readers of these pages, to know that there is also a Comet car made by the Comet Motor Co., Ltd., Quebec, Canada.—Hartford Suspension Co.

### MERITS OF ELECTRIC RIGS

Buffalo, N. Y.—Editor Motor Age—There has recently appeared in several of the newspapers of the country an article relative to speed contests and long-distance runs that have been made during the past season by electrics. One tradesman, quoted relative to his opinion regarding such performances, held that all exploitations of electrics in the way of speed and mileage redound to the injury of that particular industry. That bringing the electric vehicle out of the class of "dead" ones, and presenting it to the public in its true position that it has earned after years of hard work and experimenting to bring it to its present state of efficiency, does not appear to me as in any wise injurious. It took years of breeding to produce the 2-minute trotter; that the 2-minute horse is a detriment to the horse world we think no one will admit, but it is not expected that every horse bred can make a mile in that time, or under anything except the very best conditions. The same good rule applies to the electric vehicle. It is well known that Mr. Edison has been promising for years the 100-mile electric battery, and everyone has been waiting and looking eagerly for it. That the 100-mile electric on one charge of the battery, over ideal conditions, has arrived, was established by me over 2½ years ago; that quite a number of manufacturers, besides, have produced electric vehicles capable of making approximately that number of miles on one charge of the battery has been repeatedly proven during the past year; that under favorable conditions they can be used to quite an extent for touring has also been proven, and these trips have been made with cars regularly equipped with batteries such as are delivered to customers—in fact, by what is known as regular stock car equipment. That they have been able to do this does not, in my opinion, do the slightest particle of harm to the industry, but on the contrary, is of material benefit. That the electric car is a touring car proposition no one is led to think, but that the electric car of today has a much greater radius than it had a few years ago is now a well established fact to my way of thinking.—F. A. Babcock.

### HIGH CRANKSHAFT SPEED

Cincinnati, O.—Editor Motor Age—Through the Readers' Clearing House will Motor Age state the most revolutions per minute attained by any gas or gasoline engine?—Subscriber.

The highest crankshaft speed obtained on motors in long distance performances has been 2,800 revolutions per minute, which has been maintained by certain single-cylinder foreign cars for periods of an hour or more at a time. The crankshaft speed means a piston speed of over 2,600 feet per minute, which is very high, in view of the fact that from 800 to 1,000 feet per minute piston speed was considered best a couple of years ago. Four-cylinder engines are now made in America which will show crankshaft speeds of 2,200 revolutions per minute constantly for reasonable runs. One or two European motors of the four-cylinder type have run at 2,400 revolutions per minute for consecutive hours.

### CARBURETER TROUBLES?

Stillwater, Okla.—Editor Motor Age—Will Motor Age please advise me through the Readers' Clearing House regarding the following: I have been having a great deal of trouble with a two-cylinder opposed Beaver engine of 20 horsepower. I can get one cylinder to run all right at any speed but the other will not run regularly. I can adjust the carbureter so that it will run regularly at either high or low speed but I can't get it so it will work at both points by opening and closing the throttle. The engine is new, the valves are all right and there is a good spark. As it hits regularly at high or low speed it seems to me that it must be in the carbureter as I have used three kinds, a Schebler, Kingston, and a Maximus, with the same results. The intake from the carbureter and the main intake pipe is connected at one side instead of the center and the cylinder with the long side is the one that is giving trouble. I wondered if this could be the fault. I have changed the height of the gasoline pipe from 3 to 10 inches above the carbureter but without results. What is the proper height? Does it make any differ-

ence if the gasoline pipe drops 5 or 6 inches below the carbureter and then comes back up to it? Any information on the matter will be greatly appreciated by a subscriber.—H. E. R.

At this distance, it would seem that the trouble lies in the carbureter adjustment. The carbureters you mention have separate adjustments for both high and low motor speeds. The adjusting needle is for low speed adjustment, and the auxiliary air valve is for high speed. The fact that the lead through the manifold is a little longer for one cylinder than the other should not effect the motor unless the mixture has a very short bend to make to one cylinder and not to the other. The lead for the gasoline will not change results, providing that the gasoline tank is higher than the carbureter.

In adjusting the carbureter hold the auxiliary air valve shut, and adjust by the needle valve for lower speed, so that with a nearly closed throttle you just get it to fire regularly. This done adjust for high speed with the auxiliary air medium speed as the auxiliary air valve spring will care for it.

## TWO CYLINDERS VS. FOUR

Stillman Valley, Ill.—Editor Motor Age—Will Motor Age state its opinion regarding the respective merits of four and two-cylinder engines up to 20 horsepower on light cars?—W. A. Miller.

The four-cylinder motor has a decided advantage over the two-cylinder by having a more constant torque. In other words, it gets two explosions to each revolution of the flywheel, while the two-cylinder only gets one. In the hands of the novice, the two-cylinder engine may perhaps be better, in that it will not stall as quickly by reason of the heavier flywheel. The four-cylinder with vertical cylinders is easier to lubricate than the two-cylinder type with horizontal cylinders.

## BRISCOE'S DEDUCTIONS

Tarrytown, N. Y.—Editor Motor Age—The tremendous possibilities for a high grade car of moderate price is shown by some statistics in census bulletin 84, in reference to the wagon industry. In 1905 in the United States there were sold 907,000 buggies, of which 769,000 were the ordinary two-passenger four-wheeled type; 138,000 were for three or more passengers; in addition there were 133,000 business wagons sold, not including farm wagons. Compare these figures now with the number of motor cars that will be produced in 1909. If the information I gathered from the advertising departments of the various manufacturers is to be depended upon, there is going to be turned out over 2,500,000 cars. However, after these "pipe dreams" are over, I find in reality that there will be made during the coming season approximately 90,000 motor cars. The prices at which these 90,000 cars will be sold leads me to believe, from statistics which have come to my attention, that out of every thousand cars made 470 of them will be sold at a price of $700 or less, 320 will be sold at a price of from $700 to $1,000, and 135 will be sold at a price ranging from $1,500 to $2,500, and only seventy-five at $2,500 or over. Those two sets of figures, namely, the number of horse-drawn vehicles made in 1 year in the United States, which totals over 1,700,000, and the fact that practically half of the motor cars manufactured will sell at less than $700, shows the tremendous field for a high-grade car that costs to buy little more, if any, than a horse and buggy, and infinitely less to keep. I make the prediction that in 10 years horses for purely business purposes will be as rare as motor cars were 10 years ago.—Benjamin Briscoe.

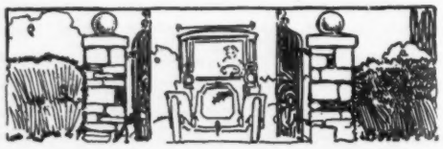
## HOW TO USE SOAP

Buffalo, N. Y.—Editor Motor Age—Relative to the use of soaps for washing car bodies, I find that a high grade oil soap is everywhere giving great satisfaction, and is generally used at garages. The proper way to use such a soap is to first provide a receptacle for dissolving a quantity of the soap in advance of its use. Into this receptacle put a quantity of soap, say from 1 to 10 pounds, pour over it three times as much hot water, and stir until thoroughly dissolved. Of this solution use a half cupful to one cupful in a pail of water, according to whether the machine or other surface is very dirty or not. The more of the solution used, the stronger it is, of course, but a very little is generally sufficient. After the soap is dissolved, it may be used in either warm or cold water, but naturally warm water cleans better than cold.—A. D. White.

## ON SHAPE OF PISTON HEAD

Davenport, Ia.—Editor Motor Age—Will Motor Age please state, through the Readers' Clearing House, which has the most power, a cylinder with a convex piston head, a flat head, or a convex head? These cylinders, of course, are to be the same size, have the same compression, and to be alike in all respects except that the piston heads are different. Will Motor Age kindly explain the decision? Also, of what materials are the Packard 1908 front gears made? How does this material wear?—A subscriber.

Experiments made with different styles of piston heads would go to show that the flat head is the more powerful. When a mixture explodes within a cylinder the waves are spherical and travel with equal force in all directions, but all parts of each spherical wave do not have the same effect or power in forcing the piston downward. That part of each explosion wave with the greatest vertical force will prove most valuable; the remainder of the explosion wave strikes the piston head at an angle and the downward effect on the piston is proportionate to the angle. With a concave piston head more of the wave strikes at right angles to the head surface, but very little of it is in the vertical line of piston travel, and so the result is to some extent lost in side thrust. The same holds good in the convex piston head. The value of the convex head is that it is a stronger construction and can be made lighter, which is a valuable consideration. The concave head is a difficult feature in lubrication. The half-time gears on the 1909 Packard are made of fiber, the others being steel. As to their wearing qualities, a Chicago owner enthusiastically asserts he has driven his car 13,000 miles since last August and that his motor is running very sweetly and true.



## DIFFERENCE IN MAGNETO

Wingate, Ind.—Editor Motor Age—Will Motor Age kindly explain in detail the difference between low and high-tension ignition. The report of the French show in Motor Age, December 10 issue, states that nearly all foreign manufacturers are quitting the low-tension and taking up the high. This would apparently indicate the superiority of the high-tension. If this is the case, why do some of our best American manufacturers adhere to the low-tention?—J. W. McCorkle.

Several foreign manufacturers always have used make-and-break ignition with a low-tension magneto on account of the simplicity of the wiring and the few parts used. The perfection of the high-tension magneto now permits a still greater simplicity by using a jump spark. This eliminates the make-and-break apparatus, and needs no more wiring than the old system. The incorporation of the coil and distributer parts within it has made the high-tension magneto a completely enclosed unit, and one which is readily detachable. The make-and-break system calls for special cylinder castings unless the magnetic spark plug is used.

## NOT MAKING CARROLL MOTOR

Bon Aqua, Tenn.—Editor Motor Age—Through the Readers' Clearing House kindly inform me whether or not the carbonic acid motor invented by John Carroll of Philadelphia, Pa., and which was described in Motor Age, August 27, page 14, has proven itself to be practical and to meet the requirements claimed by the inventor. Has the inventor perfected arrangements with a reliable company to manufacture the motor in quantities?—A Subscriber.

Repeated tests have proven that this motor works very satisfactorily, but Motor Age is not aware of any completed arrangements to manufacture it for the market.

# Legal Lights and Side Lights

## WANTS HORNS REMOVED

THE removal of all bells and horns from motor cars is being advocated by Supervisor Spengel, of Denver, and he probably will present a bill for an ordinance legislating the signal apparatus out of use. Mr. Spengel holds the view that the chauffeur and not the pedestrian should be made to keep a sharp lookout. Experience has taught him that without a signal the driver of a machine will use great care in running the car, whereas with the signal he dashes along, relying on the people on the street to give heed to his warning. Several years ago, when bicycles were so popular, a law was enacted which compelled riders to do away with bells. The results were entirely satisfactory to the police department, and Mr. Spengel cites the case of the bicycle in support of his contention against motor car signals.

## MARYLAND'S TENTATIVE BILL

The Maryland motor car commission has drafted a tentative bill which, if passed by the next general assembly, will bring about an enormous increase in the taxes of motor cars in this state. The bill was prepared by Sherlock Swann, a member of the commission, who has incorporated the best features of the motor car laws of twenty states. The bill proposes a graduated tax, according to the horsepower of the machines, from $6 as a minimum to $24 as a maximum. It also proposes to devote the revenue from this tax in meeting interest payments on the $5,000,000 loan for good roads, allowed by the last legislature, and for such other purposes as the state roads commission may decide. Governor Crothers and the members of the commission declare that during the first year after the operation of the proposed new law the revenues from the motor car tax will be between $75,000 and $100,000, and that 10 years hence the annual revenue will be as high as $400,000. This would be twice as much as is necessary to meet the interest on the issue of the state stock of $5,000,000 for good roads. This increase in the revenue will be due to the anticipated increase in motor cars. At present the tax is only $3, which is an annual one, but which lasts during the life of the machine. In consequence of the large revenues to be derived from this motor car tax, Governor Crothers has announced that he favors a second bond issue of $6,000,000 for additional improved highways in Maryland, $2,000,000 of which he would have used in improving the streets of Baltimore. He has declared that this second loan, as well as the first one, of $5,000,000, would not cost the state a cent of direct taxes if the new motor car bill becomes a law. The tentative motor car bill also provides for the collection of the motor car tax, the examination of chauffeurs and the general enforcement of the law be committed to an official created for that purpose. A liberal speed limit is to be allowed, to be fixed according to cities, towns, suburbs and upon crowded streets. Streets or roads are divided into three sections—cities, thickly settled and sparsely settled sections. Speed will be regulated for each of these sections. Heavy penalties are provided for violations of the speed limit. In addition to fines and imprisonment, licenses may be revoked. The fines will be turned over to the state road commission.

## COLORADO'S LATEST

Secretary Frank England, of the Denver Motor Club, who also is an attorney by profession, has drafted a law to govern the operation of motor cars which will be presented in the Colorado legislature. Some of the principal features are: It provides for the creation of a motor car commission of three—a lawyer, an expert motor vehicle operator and an expert road builder—which also is a highway commission to expend the fees received from registrations of $2 each; a speed limit from 6 to 25 miles; non-residents granted privileges of the roads for 30 days without license; misdemeanor for chauffeur to accept a bonus or discounts on supplies purchased; state license per car, $2; chauffeur's license, $2; general dealer's and manufacturer's license, $10. There is a prevalent belief that the chances for a good roads appropriation from the in-coming leigslature is very flattering.

## NEW ANTI-SCORCHING IDEA

The Automobile Club of Pittsburg and the Wilkinsburg Automobile Club are trying to have an arrangement made with the city authorities so that it will not be necessary for any member of the two clubs to go to the police station and give bond either for themselves or their employes when arrested for speeding. The members claim that the average policeman has absolutely no idea of how fast a car is going and takes it upon himself to arrest motorists every time he sees a possible chance. The new arrangement makes the clubs responsible for the individual member's actions after they are arrested and by relieving the owners of the annoyance and disgrace of being taken to the police station under police escort, puts every member upon his honor and thus reduces the amount of speeding which will be done.

## AGAINST THE MOTORIST

The Connecticut supreme court has issued a warning to motorists in a decision just handed down. One Annie Irwin brought suit against Franklin Judge for personal injuries received as a result of a collision with Judge's car. The case was tried before Judge Scott, of Fairfield county, and a jury. The verdict and judgment of $500 was for the plaintiff. A motion to set aside the verdict was denied. The defendant appealed the case, but the supreme court found no error. Miss Irwin was injured in August, 1906, and at that time was about 16 years old. She was riding a bicycle and was struck by Judge's car, which was on the wrong side of the road and going at a fast rate. Judge Hall, in his opinion, says: "To persons riding along or crossing our public roads, and especially our city streets, the rapidly moving motor car is a source of constant danger. Their great weight and speed power and resulting momentum render the consequences of a collision with them much more serious than with ordinary carriages, even moving at a higher rate of speed, and it is much more difficult to avoid the rapidly moving motor car than the street railway car, which has a fixed and known direction and course upon its tracks. While owners of motor cars have the right to drive them upon the public streets, yet the proper protection of equal rights to all to use the highways necessarily requires the adoption of different regulations for the different methods of such use; and what may be a safe rate of speed at which to ride a bicycle or drive a horse may be an unreasonably rapid rate at which to drive a motor car in the same place. For the seasons stated and others which might be given, driving of a motor car at a high rate of speed through city streets at times when and places where other vehicles are constantly passing, and men, women and children are liable to be crossing; around corners at the intersections of streets; or in passing street cars from which passengers have just alighted, or may be about to alight; or in other similar places and situations where people are liable to fail to observe an approaching motor car, is in itself actionable negligence. One operating a motor car under such circumstances is bound to take notice of peculiar danger of collisions in such places. He cannot secure immunity from liability by merely sounding his horn. He must run his car only at such speed as will enable him to timely stop it to avoid collisions. If he fails to do so, he is responsible for the damage he thereby causes."

# FROM the FOUR WINDS

PREMIER ACTS AS SNOW PLOW IN INDIANAPOLIS

**New Badger Club Director**—The Milwaukee Automobile Club has elected J. E. Farber a director to succeed O. Z. Bartlett, who was killed recently. Eight new members have been accepted by the Milwaukee Automobile Club.

**Premier As Snow Plow**—While several hundred men and a large number of teams were combatting with the snow in Indianapolis a few days ago, the Premier Motor Mfg. Co. solved the problem on the streets in the vicinity of the plant. One of the test cars was attached to a heavy snow plow and this combination made short work of the snow on the sidewalks, as well as in the streets. The speedometer on the car showed that 31 miles of walks were cleaned and the driver was especially pleased with the work, enjoying the distinction of being able to drive on the sidewalks without interference by the police.

**Baltimore Club Meeting**—At the semi-monthly meeting of the Automobile Club of Maryland it was decided to hold a motor car show the latter part of February at the Fifth Regiment armory, under the auspices of the club. The exact date has not quite been decided upon, but February 24 seems to be the most likely time. Osborne I. Yellott, counsel for the club, made a lengthy talk on the proposed special tax of motor cars to help build roads throughout Maryland, after which the announcement was made that the club was emphatically opposed to the proposition, contrary to the previous stand of several members. The owners of motor cars, it was argued, now pay a personal tax and if the proposed bill was passed it would put an extra tax of $60 on a $3,000 car and $80 on a $4,000 machine and even higher rates in proportion to the value of the car. A movement was made at the meeting to secure a country club 10 or 12 miles from the city. The club also passed resolutions favoring the proposed national highway from Washington to Gettysburg.

**Will Publish Route Books**—Having been engaged for the past year and a half in gathering data of routes leading out of the Quaker City, the Automobile Club of Philadelphia has decided to publish a book of routes which it is felt will be welcomed by every motorist in the state. These routes include not only trips to near-by cities and resorts, but also includes the full details for the tourist contemplating trips to various points in New Jersey, western Pennsylvania and even as far as the New England mountain and seaside resorts.

**Milwaukee Show Dates**—The first show in the history of the motor car industry in Wisconsin will be held at the Hippodrome in Milwaukee on March 11, 12 and 13. The Milwaukee Automobile Club has just announced its plans for the exposition after considering the matter for 2 or 3 months. The Hippodrome will be used this year, and beginning in 1910 shows will be held annually in the Milwaukee auditorium, under construction at a cost of $500,000. The auditorium will not be completed until April 1. The Hippodrome is located on Wells street, between Sixth and Seventh streets, in the heart of the motor car agency quarter of the west side in Milwaukee. It has a clear floor space of 125 by 125, sufficient to meet the requirements of the first show, it is believed. It seats 4,500 people, including the floor space. The auditorium is only two blocks away. There are now about thirty-five agencies in Milwaukee and forty makes are represented.

**Club for Two-Wheelers**—Motor cyclists in Wilkes-Barre have just organized under the name of the Reading Standard Motor Cycle Club, with John Noble, president; F. A. Conners, secretary, and Fred Eddy, treasurer. There are twenty charter members.

**Would Oil Streets**—C. G. Carpenter, superintendent of Milwaukee's extensive park system, has proposed to the park commission that all streets in and adjacent to the parks be oiled next spring to abolish the dust nuisance. It is believed that the commission will experiment.

**Race on the Ice**—Motor car contests on the ice are the latest additions to Milwaukee's sporting calendar. A 3-mile straightaway course is being laid out on Milwaukee river, 1 mile of this being the course used for the Sunday matinees of the Speedway club. A special mid-winter matinee will be held soon.

**Tariff Conference Called**—About 5,000 invitations have been sent out by the invitation committee of the national tariff conference, which will be held in Indianapolis February 16-17-18. These invitations have been sent to industrial, financial and commercial organizations as well as to the governor of each state and the mayor of each city of more than 10,000 inhabitants. It is expected that President Roosevelt and William H. Taft, president-elect, will attend, although acceptances of the invitations sent them have not yet been made. The conference will urge a national tariff committee to which can be referred all questions relating to the tariff.

**Test for Little Cars**—The midwinter endurance run from Hartford, Conn., to Pittsfield and return is now practically assured. The Maxwell agent in Hartford issued a challenge for a run to Pittsfield, cars listing under $1,000 being eligible. Thursday, January 28, is the date set for the run which is to be of a go-as-you-please nature. The start will be made at Hartford and all entries must be straight stock cars selling at not more than $1,000. Each car will be required to carry its full catalog equipment and to cover the course without aid from any other car, but, if the entrant desires to get out and walk, tack on to the end of a bob sled or coast down hill, or stop the engine at any time, that is his privilege. The time limit is 8 hours and the car nearest approaching this time will be declared the winner. H. P. Maxim and C. H. Gillette of the contest committee of the Automobile Club of Hartford and Henry Souther, are the judges of the contest. The Holsman has

been entered for the contest as well as two Maxwells, a Mitchell and a Buick. The entire distance to be covered is approximately 150 miles.

**Good Signboarding Done**—The December report of the routes, maps and signs committee of the Automobile Club of Philadelphia shows that during that month twenty-two mileage and fourteen direction signs were placed on the Philadelphia-Gettysburg route. The work has been completed to gap, where the Lancaster Automobile Club will continue it to York.

**Against Toll Gates**—The Automobile Club of Pittsburg is taking an active interest in the proposed legislation at Harrisburg to do away with Pennsylvania toll gates. It is declared that the total toll gate charge for every motorist that goes over the Glidden course in the Keystone State is $1.68. The tolls vary from 10 to 13 cents per gate and add not a little to the running charges of the hundreds of motorists who drive through western Pennsylvania.

**Reo Included**—The regulations issued by the treasury department at Washington on March 22, 1907, providing for the allowance of drawback on motor cars manufactured by the Pope Motor Car Co., of Toledo, with the use of imported magnetos with coil and switch attached, have been extended, as far as applicable, to cover motor cars manufactured by the Reo Motor Car Co., of Lansing, Mich., with the use of imported Eisemann-Lavalette magnetos with coil and switch.

**After Legislation**—The Automobile Club of Pittsburg is getting itself ready to make a definite and very positive showing at this season of the Pennsylvania state legislature. Secretary Paul C. Wolff, who is also president of the Pennsylvania Motor Federation, has three measures ready for presentation to the legislature at the earliest opportunity and he is receiving assurances from legislators all over the state that this will have proper support. Governor Edwin S. Stuart is taking an active interest in the matter of improving the highways and also of abolishing toll gates and is gathering all the information he can to apply on this subject.

**Suggests Coöperation**—A suggestion has been received by the Maryland state road commission from the Pennsylvania authorities for a plan of road building by which an inter-state system of highways might be constructed, connecting the larger cities of the two states. The proposition contemplates the construction of a roadway from Washington to Baltimore, thence to Gettysburg, thence to Philadelphia, with still another extension connecting Harrisburg and Pittsburg. This is similar to the proposition the Maryland commissioners have in view for the Lincoln memorial boulevard, which it is proposed the government shall build from Washington to Gettysburg, via Baltimore. A conference will be arranged between the Maryland commission and the Pennsylvania authorities to thoroughly discuss this inter-state road idea.

**Praise from Fire Chief**—Chief Thomas A. Clancy, of the Milwaukee fire department, in his annual report says that he has excellent arguments why motor cars should be used instead of horses. The city of Milwaukee purchased a car for the chief last year. The expense, outside of the car, which is very low, for 1908, is distributed as follows: Feeding 240 horses, $31,038; fuel, including heating of stations besides fire engines, 24,700; horseshoeing, $6,000; horse medicine, $750. The daily cost of feeding each horse is 35 cents, it is estimated by the chief.

**Another Fee Bill**—Senator Allds has introduced at Albany a bill proposing an annual motor car registration fee. The bill provides a tax of $5 for machines weighing 1,500 pounds; $10 for machines weighing 2,500 pounds and $5 for each additional 500 pounds. Senator Grady has introduced a bill which would send motorists violating the speed limit to jail for 30 days and impose a fine of $100. A term of imprisonment not less than 1 year and a fine of $1,000 would be meted out to a careless driver who had injured a person. The driver may be convicted of manslaughter in the second degree if death to the injured person results.

**Farmers Organize**—The farmers of Baltimore county, Maryland, have organized a good roads organization to secure better highways in their locality. At the first meeting the association, which is known as the Farmers' Good Roads Organization of Maryland, the following resolution was passed: "Resolved, That the plan of general road improvement in the state be adopted; that the state take over the main thoroughfares leading from the city throughout the county, and that the county build the connecting roads. A permanent roads committee of Baltimore county was appointed to coöperate with other committees of the Farmers' organization which will be used as a big stick to secure the improvement of the roads throughout the state.

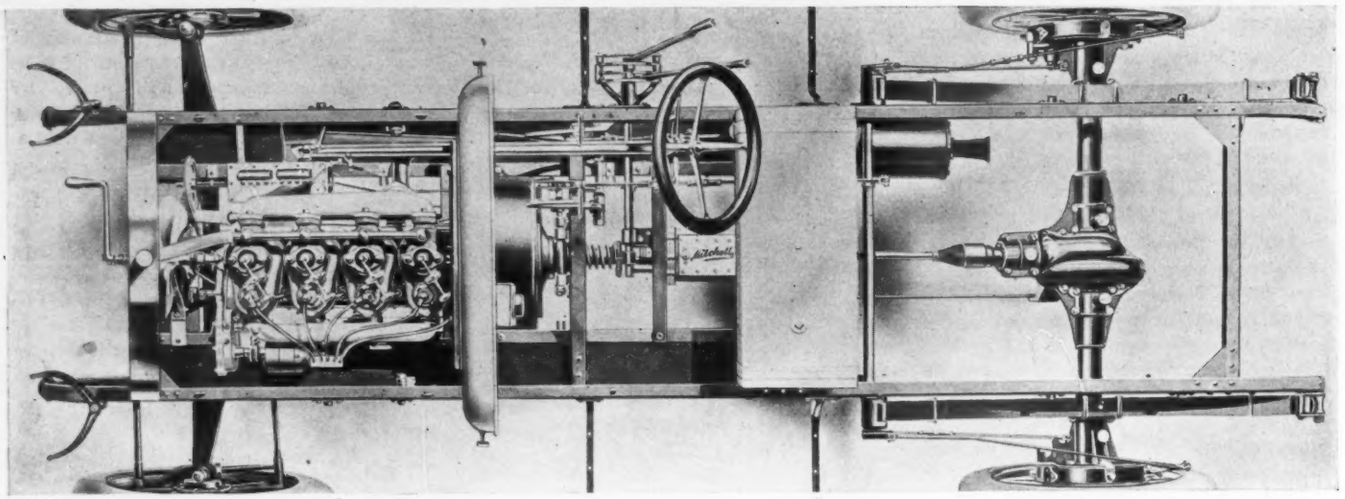
**Looking up Fines**—Treasurer and Counsel S. Boyer Davis, of the Automobile Club of Philadelphia is gathering statistics from the members of that organization with a view of discovering how many of them have been fined in the state of New Jersey during the past 6 months. He states that "it has been found that some of the fines collected have not been turned over to the state, and it is with the object of determining how far this practice has prevailed that this request is made."

**Early Endurance Run**—The Pittsburg Gazette-Times and the Pittsburg Chronicle-Telegraph will conduct a motor car endurance run on March 17, 18 and 19, for all classes, divided according to the selling prices of the cars. The cars will start at the Hotel Schenley at 7 o'clock every morning and return to the hotel in the evening. The daily runs will cover a neighborhood of 150 miles, so that in the 3 days the cars will have got over a good part of western Pennsylvania. Among the big towns which will be taken in on the trips are Johnstown, Greensburg, Washington, Uniontown, Waynesburg, Butler, New Castle, Beaver, Meadville, Cambridge Springs and Erie.

**West Chosen President**—The Automobile Club of Washington, D. C., has elected the following officers for the ensuing year: President, W. D. West; vice-president, O. J. DeMoll; secretary, John K. Heyl; treasurer, H. C. Chandlee; captain, J. A. Muehleisen; lieutenant, L. D. Moore, Jr.; governors, R. B. Caverly, W. W. Chiswell, J. M. Stoddard and F. R. Gordon. This is an entire new slate with the exception of the treasurer, Mr. Chandlee, who was re-elected. The club is in a flourishing condition, the membership having been increased from sixty-nine to 130 during the year. It will be the aim of the new officers to still further increase the membership and to increase the club's activities.

THREE MATHESONS THAT WON RENOWN IN PHILADELPHIA RELIABILITY

# THE MITCHELL 1909 CAR MODELS



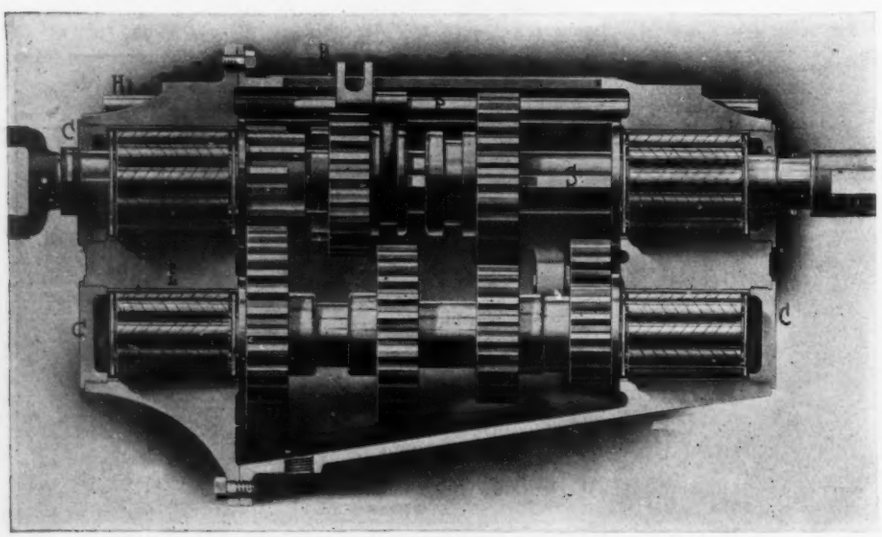
MITCHELL CHASSIS WITH SELECTIVE GEARSET, MAGNETO AND OTHER IMPROVEMENTS

A 20-HORSEPOWER runabout, five-passenger 30-horsepower touring car, and a five or seven-passenger 40-horsepower touring car, three in all, constitute the 1909 Mitchell car program. The company contemplates building in all over 3,000 cars, most of which will be the new 30-horsepower touring car, which the Mitchell Motor Car Co. is introducing for the first time this year. Next to it will come the two carried over but improved models, the 20-horsepower runabout, and the big 40-horsepower touring car.

Mitchell cars for this year contain a great many improvements over last year's type, and, although the company is going to manufacture them in increased quantities, a great many details of manufacture will be more carefully looked after this year than heretofore. The gamut of alterations and improvements, starting with the motor, consists in the fitting of magnetos for the first time by this company on the 30 and 40-horsepower styles, the Splitdorf type being the one selected. It is located on an integral bed piece at the left front of the motor and driven from an enclosed gear in the half-time compartment. In addition to this magneto outfit is the regular battery system, one set of plugs, however, sufficing for both, and the magneto distributor serving for the battery system.

**Selective Transmission Adopted**

Of paramount importance in the transmission set is the use of a selective system adopted for the first time by this company which offers three speed variations. A further change, in addition to the use of the selectively operative system, is the employment of Hyatt roller bearings for both shafts of the case instead of plain bearings heretofore employed. Still further in this gearbox improvement role is the employment of Vanadium steel for the first time by the company, it being used in the gears and shafts. The case is a one-piece aluminum casting, with a removable front end plate E, which fills the complete front of the gearbox and bolts to the main part of the case. The use of threaded bearing caps C protects the Hyatt rollers from dust and prevents the leaking of oil. The main shaft S, carried in the top of the case, has the two sliding units, operated from shifter rods R enclosed in the case above the shaft, and with U engaging slots H, which extend through a slotted opening in the cover of the case. Over this opening fits the covering carrying the inner end of the sleeve on which the gear-shift lever is attached. This is the construction in the 40-horsepower car; but, in the 20 and 30-horsepower types the engaging pieces H are at the front end of the rods, as indicated in the position H1, and in which position the cross of the T arm on the change-speed lever sleeve is not enclosed, the sleeve being shifted endwise in the usual manner to engage with one or the other of the shifting rods. Direct drive is obtained on the third speed by opposing faced teeth T, on the forward sliding unit, and on the front short shaft. In the lowest part of the base of the case is an opening J for draining off the oil supply.

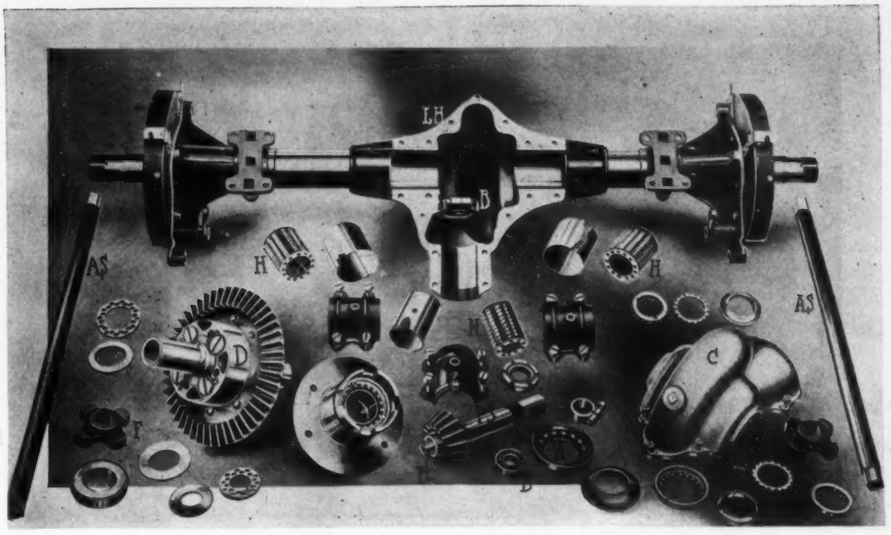


MITCHELL SELECTIVE GEARSET WITH HYATT ROLLER BEARINGS

**Details of the Big Car**

The 40-horsepower car has been improved by the addition of a floating rear axle, the first of its kind ever installed on Mitchell cars and only used on this model, the 20 and 30 horse types carrying semi-floating live rear axles. An assembly

illustration of this axle shows the two-part differential casting with the lower half LH in place, and the cover C removed, showing how the differential unit D may be removed intact without further dismembering the axle. The pinion shaft PS is supported on one of the Hyatt races H and by the annular ball bearing B in rear of the pinion, so that the projecting end B1 of the shaft is carried in this bearing. The axle driveshafts AS are a squared fit in the differential and are carried at their inner ends on Hyatt races H and at their outer ends on cup and cone bearings A. The transference of power from the ends of the driveshafts AS to the wheel hubs is by means of four arm clutches F which are a squared fit over the ends of the axle shafts and lock with corresponding arms on the wheel hubs.

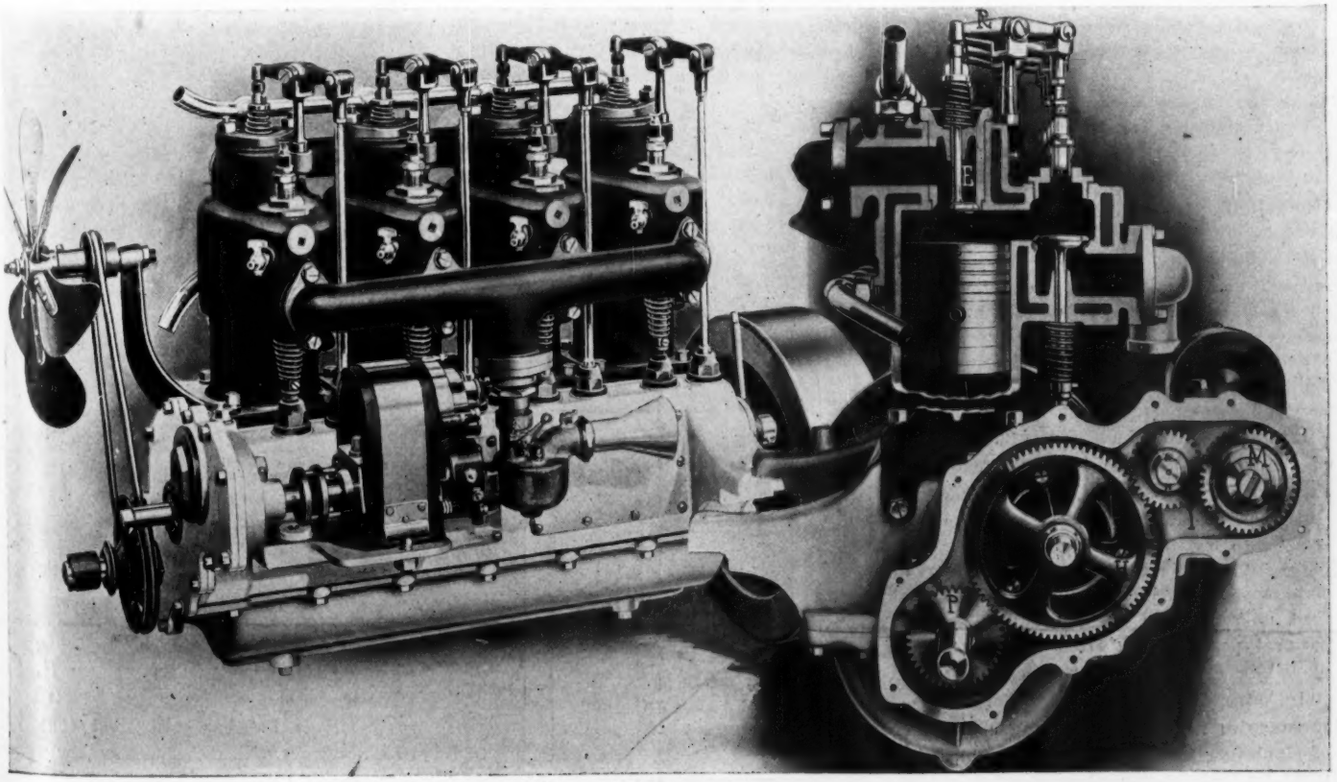



ASSEMBLY OF FLOATING REAR AXLE IN 40-HORSEPOWER MITCHELL

The running gears of all models have been improved in riding qualities by offsetting the springs on their axle seatings. Last year the front and rear semi-elliptics were mounted centrally over the axle. This year the front springs are attached to the seatings at a point ahead of the center, making the spring length shorter in front of than in the rear of the axle, which construction also is used in connection with the rear springs. A change in the spring suspension is found in the 40-horsepower car in which a rear platform spring is used for the first time, the cross member of which carries the frame through a bracket extending rearward from the center of the cross piece. On this 40-horsepower model the wheelbase has been lengthened from 112 to 117 inches, making it possible to increase the passenger accommodation from five to seven, thus marking the entry of this company into the big class field. The wheels have been increased from 32 to 34 inches in diameter, and the tires from 4 to 4½ inches. In the 20-horsepower runabout 32 by 3½-inch tires have taken the place of 30 by 3½ used this year.

The Mitchell motors, while differing in power, are practically alike on all three models in design. On a formula rating the horsepower of the three types is as follows: Model 20, 4 by 4-inch, 25.6 horsepower; model 30, 4¼ by 4½-inch, 28.9 horsepower; model 40, 4¾ by 5-inch, 36.1 horsepower.

The cylinders are separate castings with intake valves in chambers on the left side, and exhaust valves in the cylinder heads towards the right side, the end view of the motor illustrating this as well as showing how carefully the exhaust valve cage E is waterjacketed throughout its entire length on the right side. The rocker arms R are supported on studs S yoked at their upper ends and held in eye holes on the cylinder casting. Both sets are operated from the one camshaft. This illustration of the forward half-time gear covering removed shows the crankshaft pinion P,




MITCHELL MOTOR WITH EXHAUST VALVE E, AND TIMING GEARS DISCLOSED

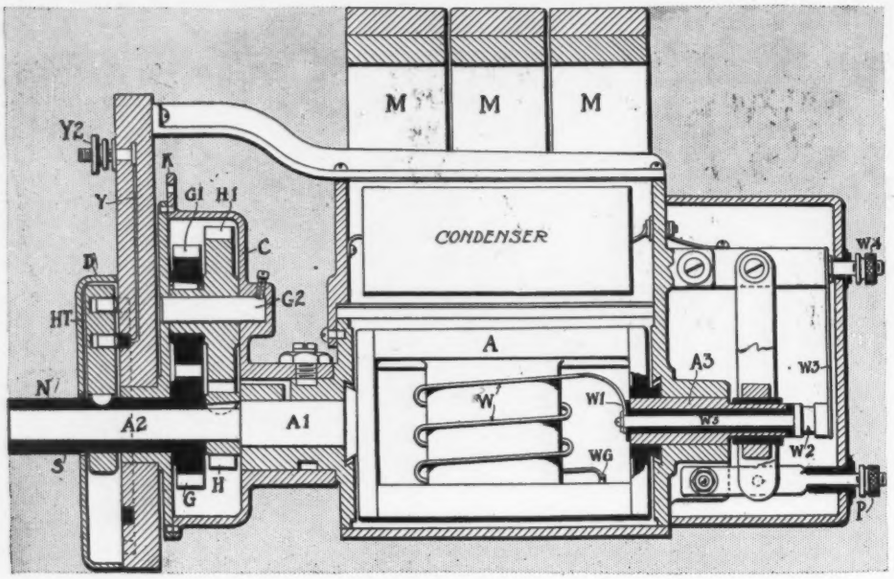



FIG. 1.—SECTION OF FAWN LOW-TENSION MAGNETO

which is cut from an integral flange on the crankshaft, the large half-time gear H, the idler I and the gear M for driving the magneto and water pump. The crankshaft is a five-bearing forging, each supported in the upper half of the case and re-enforced by horizontal ridges extending to the right and left of the crankcase walls.

Cooling is cared for by a vertical tube radiator, slightly altered in design over the present by being made higher, and, instead of the two-sloped top, there is a center horizontal piece and sloping sides. On the 30 and 40-horsepower types the water pump is driven at crankshaft speed, but on the 20 at camshaft speed. Additional cooling is provided by a belt-driven fan.

**Holley Carbureter Used**

The carbureter fitted on all models is a Holley, which has been redesigned to meet the desires of the Mitchell factory, the redesigning being in connection with the spraying nozzle, whereby, it is claimed, a better intake air circulation is obtained around the nozzle, the result being to obtain higher motor speeds with the same size carbureter. Lubrication is reposed in a belt-driven McCord oiler, carried on the right side of the motor and delivering oil to the important motor parts.

Interesting Mitchell features, outside of the motor, are the leather-faced cone clutch with cork inserts, which the company has continued the use of since its entry into the four-cylinder field; the employment of Spicer universal joints in the 40-horsepower driveshaft, and the Hartford universals in the 20 and 30-horsepower types. I-beam front axles are employed in all models, but in cars with a 60-inch tread, intended for southern roads, these axles are Maganese bronze instead of steel forgings. The company manufactures its own frames, purchasing only the pressed steel side members and cross pieces, which are riveted in place at the factory.

The specifications of the different models are as follows: Model J—20 horsepower, cylinder diameter, 4 inches; piston stroke, 4 inches; wheelbase, 92 inches; capacity, two passengers with rumble seat extra. Model K, 30 horsepower, cylinder diameter, 4¼ inches; piston stroke, 4½ inches; wheelbase, 105 inches; capacity, five passengers with detachable tonneau. Model L—40 horsepower, cylinder diameter, 4¾ inches; piston stroke, 5 inches; wheelbase, 117 inches; capacity, five passengers, ironed for 2 extra seats.

## FAWN LOW-TENSION MAGNETO

A low-tension magneto and one with several unique features is being manufactured by the Fawn River Mfg. Co., Constantine, Mich., and which is illustrated in Figs. 1, 2 and 3. The feature of this magneto is that it is driven from the distributor end, and that its gear rotates at camshaft speed. Between this driveshaft and the armature is a one-to-two gearing, so that the armature travels as in the regular magneto at crankshaft speed. This magneto is of the open-circuit type. A particular feature of the magneto is that the spark always occurs as the armature is leaving the pole piece, which is the time when the voltage is the highest. No matter whether the spark is advanced or retarded it occurs at the same relative position between the pole pieces and the armature. Still further, in advancing or retarding the spark on this magneto, the relation of the armature to the crankshaft of the engine is changed; whereas, in the majority of magnetos, the armature is geared direct to the crankshaft and always maintains a definite relationship to it. In this type of magneto, the advancing or retarding of the spark is accomplished by swinging the breaker box; whereas, in the Fawn the armature is shifted back or forward, a part revolution as compared with the crankshaft. How these various things are accomplished is explained by the following reference to Figs. 1, 2 and 3:

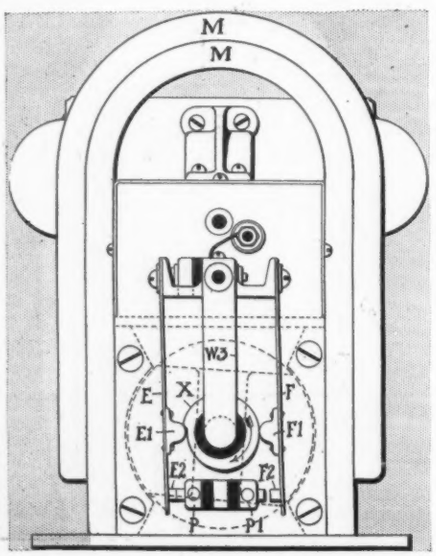
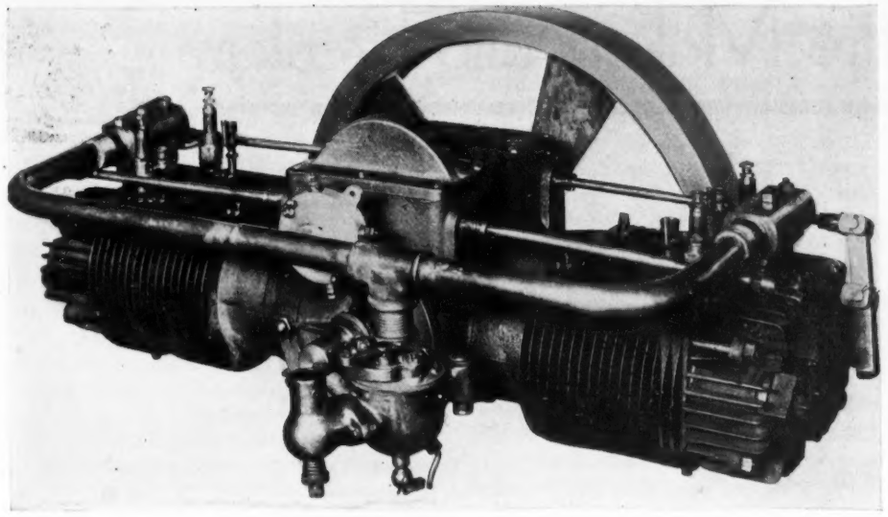



FIG. 2.—FAWN PRIMARY INTERRUPTER

The shuttle type of armature A, Fig. 1, has the usual winding, represented at W in the illustration, one end being grounded at WG, and the other end at W1, connected to a steel piece W5 through the hollow shaft A3 of the armature. The current is taken off from this through contacts W2, a spring W3, to the binding posts W4 and thence to the condenser. The other end of the armature has an enlarged shaft A1 and a restricted part A2. Keyed to this latter shaft is a gear H in mesh with a gear H1 on the countershaft G2. The hub of gear H1 carries a gear G1, which meshes with the gear G formed integral with the sleeve S, and on the outer end of this sleeve at the position N is attached the driving gear. As gears G and G1 are of the same size, but H1 double that of H, it is apparent that the sleeve N travels at half the speed of the shaft A1, due to the gear H1 being double the gear H. This results in the armature rotating at twice the speed of the sleeve S. The gearset, with the four gears, H, H1, and G, G1, is housed in a casing C, and operates in oil. This case has an arm extension K for bearing the timing and by rocking the case C through an arc of 90 degrees, the armature is correspondingly rotated, which rotation is sufficient to carry it past an impulse point, thereby enabling to start the motor without cranking it.

In Fig. 2 is shown the method of taking the current from the condenser to the single unit non-vibrating spark coil used in connection with the magneto. The spring W3, which conveys the current to the condenser, appears. From the condenser the current has two methods of traveling to the spark coil: One through the flat spring E, the other through a similar spring F. On the spring E is the hardened steel cam E1, which engages with the cam X on the armature shaft. The end of the spring carries a contact point E2, which engages with a cor-

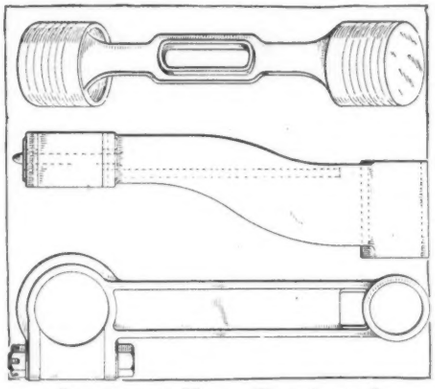


CONTINENTAL FOUR-CYLINDER ENGINE

responding one on the binding post P, from which the wire leads to the spark coil. The flat spring F is similarly provided with a hardened steel piece F1 for contact with the cam X, and its contact piece F2 for engagement with the binding post P1. The illustration shows the position for current to pass through the spring E and the binding post P, in that the cam X in this position allows the binding post E2 to engage; whereas, at the same time, the breaking points F2 are separated. The cam X is so positioned with reference to the armature that the armature is at the point of maximum current when the contacts E2 engage. A similar situation exists when the contact F2 engages. In this way, the make-and-break device, common to so many magnetos, is eliminated, the cam X performing the function of these. On the opposite end of the magneto, and illustrated in Fig 3, is the high-tension distributor brush HT, which brush is attached to the sleeve S, shown in Fig. 1. The high-tension current from the coil comes through the wire Y and binding post Y2 to the collecting ring Y1, with which the distributing arm HT is constantly in touch, and the end of the distributor passes over the contact points 1, 2, 3 and 4, the wires from which pass direct to the plug. The distributing contacts 1, 2, 3 and 4 are arc-shaped and of sufficient length so that with a maximum rock of the armature contact is not broken with these arcs. Fig. 1 shows the distributing arm encased by a covering D, which, however, is discontinued. A double set of these permanent magnets M is used.

## CONTINENTAL MOTOR

The Continental Motor Co., of Chicago, has produced and patented a four-cylinder air-cooled motor with a $4\frac{1}{16}$-inch bore and 4-inch stroke, designed for light commercial cars or motor buggies. Its prominent features are compactness of its design, absence of unnecessary parts and the ease with which it can be dismantled. This new motor has the same straight line type of cylinders, all cast in one piece, that has been used by this company in its double-opposed engine and the construction is



CONTINENTAL MOTOR, FIGS. 1 AND 2

similar to that of the double-piston water-cooled motor previously built by this concern. The cylinder heads are cast in pairs, are detachable and contain both intake and exhaust valves and valve chambers. The exhaust valves are operated by means of push rods and rocker arms from one camshaft, while the intake valves, which are automatically operated in the motor shown in the illustration, may be mechanically or automatically operated at the option of the purchaser. The intake valve chamber has a large area and completely surrounds the exhaust valve chamber; so that not only is the incoming gas thoroughly vaporized, but absorbing heat from the exhaust valves materially assists in cooling the entire cylinder head. The cooling flanges are cast integral with the cylinders and heads. The camshaft which is centrally located in the upper part of the crankcase, protrudes through the left side of the motor for attachment of the timer. The crankshaft, of the two-throw type, of nickel steel heat-treated and ground is supported by two bronze bushings of generous width fitted into side plates which are bolted to the crankcase. One of the most interesting features of this motor is the construction and arrangement of the connecting rods. The pistons, being rigidly connected in pairs by means of an integrally-cast reciprocating trunk, are connected with the crankshaft by only one connecting rod for each pair, and so arranged that each rod is oppositely disposed in relation to the one operating on a consecutive pair of cylinders. As shown in Fig. 1, the reciprocating trunk is offset to make clearance for the connecting rod, and slotted to clear the crankshaft. Fig. 2 shows the bronze connecting rod which is also offset and of heavy construction; with a bronze bushing for the hardened and ground piston pin,

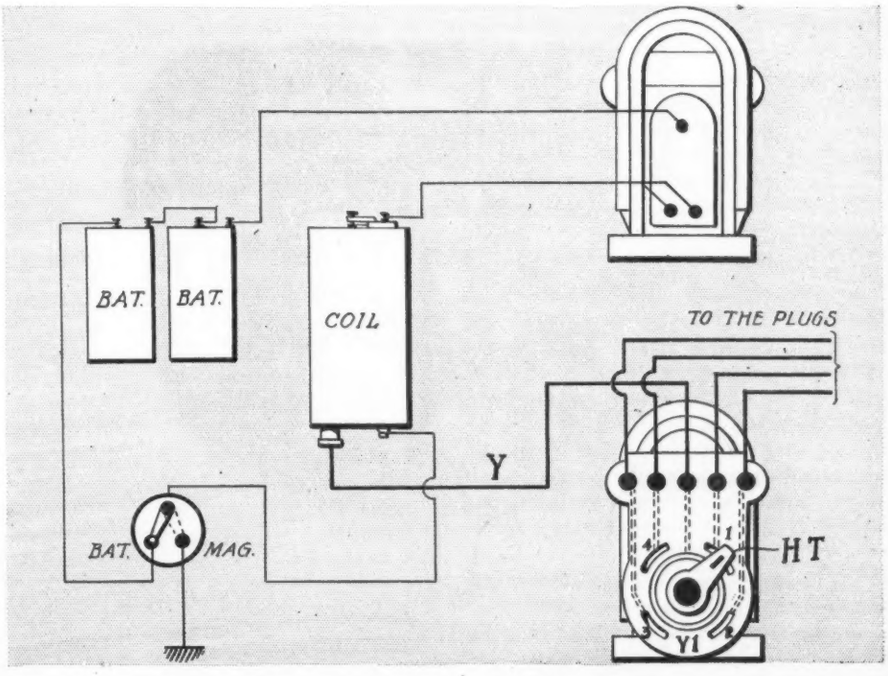



FIG. 3.—WIRING SCHEME FOR FAWN MAGNETO

# Among the Makers and Dealers

**K-W Boston Office Moves**—The Boston office of the K-W Ingition Co. has moved to 70 Long Wharf.

**Souther Consulting Engineer**—Henry Souther has been secured by the Standard Roller Bearing Co. as consulting engineer.

**Great Western in Chicago**—The Model Automobile Co., of Peru, Ind., has established a branch agency at 1326 Michigan avenue, Chicago, the concern being known as the Great Western Motor Car Co., which will handle the northwest territory.

**Territory For Wands**—G. L. Wands, formerly manager of the Boston branch of the Prest-O-Lite Co., has opened up an office at 303 Century building, Denver, Col., and will act as branch manager of the Safety Device Co., and also the Hoosier Mfg. Co. Wands will have entire charge of the business of both companies in Denver and the state of Colorado.

**Mabley's New Position**—Carlton R. Mabley, long and prominently identified with the importation of Panhard, Renault, Mercedes, and other cars of note, when the firm of Smith & Mabley was a power in the trade, and the instigator in the organization of the Smith & Mabley Mfg. Co., now the Simplex Automobile Co., has taken the general management of the Post Motor Co., 1620 Broadway, New York city, which will have the New York agency of the Hart-Kraft delivery wagons.

**Timken Buys a Plant**—The Timken Roller Bearing Axle Co. realizing the importance of Detroit as a central point in the future manufacturing of motor cars and parts, has purchased the plant of the Standard Sanitary Mfg. Co., on Clark avenue, in Detroit, Mich., the whole of which will be devoted exclusively to the manufacture of front and rear axles. The plant occupies about 3 acres. The main buildings are 430 feet long, 64 feet wide, three stories. The other buildings include drop forge plant, etc. The plant at Canton, O., will be retained for the manufacture exclusively of Timken roller bearings.

**All Denver Space Sold**—All the space for the Denver show has been taken. So great was the demand that a number of the pleasure cars will go into the big basement of the Auditorium, which was originally intended for the exhibit of commercial cars alone. In the basement also will be set up a model garage, with work bench, turntable, washing apparatus, and all the equipment needed for the proper care of a motor car. The Denver Y. M. C. A. School of Motoring will hold its sessions every afternoon here during the show, thus giving the general public an opportunity to see how the courses are conducted. The show committee has not as yet fully decided on the decoration scheme, but it promises something extremely attractive and out of the ordinary for the public.

**Legg With Carter**—William F. Legg will be the mechanical engineer in charge of the factory of the Carter Motor Car Corporation, Hyattsville, Md. Legg is a mechanical engineer, a graduate of Cornell university.

**Halle Changes**—Louis L. Halle, formerly with the Excelsior Automobile Supply Co., of Chicago, has joined the Standard Auto Supply Co., of Chicago, and has in charge the business of the company outside of Chicago, which already has assumed large proportions.

**Change of Name**—The Powell Automobile Co., of Omaha, has changed its name to the Powell Supply Co., and moved from 2010 Farnam street to 2020-22 Farnam street, where it will have over three times the floor space available in the old location. The name Powell Automobile Co. has been a misnomer for over a year past, as the company went into the jobbing supply business exclusively over a year ago, and is not handling cars of any make at the present time.

**May Buy Tube Mills**—Negotiations are in progress for the purchase of the old Pope tube mills at Hartford, Conn., which are now the property of the Shelby tube contingent. The plant, which was erected a number of years ago by the Pope company for the manufacture of tubes for the company's bicycles, has been idle for several years. It is claimed that the concern now bidding for the plant will devote its efforts to the manufacture of gasoline engines for all purposes. The property has been kept in good repair by the owners and is one of the best plants in Hartford. At one time considerable boiler tubing was manufactured for the government torpedo boats.

**New E-M-F Men**—James Heaslet has become chief engineer of the E-M-F company, and Harry L. Cunningham has assumed management of the E-M-F company's Detroit retail branch. Cunningham graduated from the engineering to the sales department of the Winton company a few years ago. During the past 4 years he has managed the Ford branch in Detroit and Cleveland. Henry Moran goes with Cunningham. Heaslet also dates back to the pioneer days. One of his early successes was the two-cylinder Autocar. The Meteor car was his next. The Garford 30 chassis—now known as the Studebaker 30—was his next. When Rainier became ambitious to make, as well as sell, cars Heaslet accepted the position of designer for the Rainier company and the 1908 car of that name was his creation.

**Death of M. & W. Man**—Albert S. Duering, Wisconsin representative of Morgan & Wright, died in Milwaukee at the age of 25 years, of typhoid fever.

**Fredrickson Incorporates**—The H. E. Fredrickson Automobile Co., of Omaha, Neb., has been incorporated with a capital stock of $100,000, all subscribed and paid in full. The incorporators are H. E. Fredrickson, president; Sidney L. Edholm, secretary and treasurer, and W. F. Kemp and Thomas M. Bromwell.

**Takes Over Rich-Spark**—The Utility Co., 636 West Forty-fourth stret, New York city, manufacturer of the UKO mica spark plug, has taken over the business and good will of the spark plug department of the Richardson Engineering Co., Hartford, whose plug was called the Rich-Spark and followed UKO closely in material and general design.

**Out For Themselves**—James Jones and George Pregler, of Portage, Wis., who, it was announced, have been appointed joint agents for the Hokanson Automobile Co., of Madison, Wis., under its system of establishing branches throughout western Wisconsin, have dropped the project and intent to get the agency for other cars and establish a garage of their own at Portage.

**Robbins & Co. Move**—Irvin Robbins & Co., of Indianapolis, manufacturers of the Robbins coupe top, have received such a large volume of orders for their specialty that they have found it advisable to move to the Industrial building, Tenth street and Canal, where they have more than twice the floor space, and have doubled their machine and bench capacity. The Robbins company has added to its limousine and coupe top business a department that it has devoted to the manufacture of touring cars and runabout bodies and specialties.

**Recovers From Fire**—The buildings containing the magnet-making department and the power plant of the Remy Electric Co., at Anderson, Ind., were completely destroyed by fire recently. The loss amounted to between $3,000 and $4,000, covered by insurance. On account of the boiler for the heating plant of the entire factory being put out of commission by the fire, the factory was shut down until repairs could be made. The fire occurring in the middle of the busiest season for the company, necessitated the quickest kind of work on the new building, and the buildings were rebuilt complete and under roof the second day after the fire.

The entire plant is running as usual and deliveries of Remy magnetos will not be delayed in any way.

**Making Non-Glare Shades**—Gray & Davis, of Amesbury, Mass., have been licensed to make the Wridgeway non-glare shades for motor car searchlights.

**Not With Bland-Mueller**—Denial is made that Mark Heath has joined the Bland-Mueller Auto Co., of Milwaukee, Mr. Heath remaining as manager of the Chicago branch of the Witherbee Igniter Co.

**Toledo Dealers Organize**—The Toledo Automobile Dealers' Association has been organized and a committee appointed to procure the signatures of other dealers to the agreement to incorporate. The committee consists of Edward Kirk, chairman; J. C. Swindeman and B. O. Gamble. Another meeting will soon be held.

**Indianapolis Change**—Dr. Herbert M. Woollen has organized the Stirling Motor Car Co. in Indianapolis with Frank M. Leary and Thomas D. Stevenson as the other members of the company. Incorporation papers showing $15,000 capital have been filed and the company has taken over the business of the Ohio Automobile Co. at 211 East Ohio street, which has conducted a garage and general repair business. An agency for one or two lines of cars may be taken later.

**Concern Reorganizes**—The Irvin Mfg. Co., of Indianapolis, has been reorganized under the name of the R. J. Irvin Mfg. Co., with $50,000 capital stock, all of which has been paid in. R. J. Irvin has been elected president and treasurer; M. S. Irvin, vice-president, and J. M. Irvin, secretary. The company is located in the Industrial building where it has about 20,000 square feet of floor space. For some time the company has been engaged in manufacturing wind shields and tops and has now taken over the top manufacturing business of the Indianapolis Motor Car Co. and two smaller Indiana concerns. Both motor car and motor boat tops will be made.

**Metz Buys Orient Plant**—C. H. Metz has acquired the ownership of the Orient plant, succeeding to the business and good will of the Waltham Mfg. Co. In so doing Mr. Metz becomes, it is said, the largest individual operator of a motor car plant in America. In the days of the bicycle his production of the Union 2:10 led the crusade against the heavy, cumbersome boneshaker. In 1893 he organized the Waltham Mfg. Co. and startled the bicycle-riding fraternity by announcing a 21-pound roadster with a guarantee that it would stand up under any rider, on any road, at any speed. The Waltham company was the first in America to take up the manufacture of motor cars using the Daimler type of engine. In 1901 Metz severed his connection with the company and on his own account built the Metz motor cycle. Later he became affiliated with the American Motor Co., making the Marsh-Metz machines.

**Rushing Rider-Lewis Plant**—Work on the new Rider-Lewis Motor Car Co.'s plant at Anderson, Ind., is progressing rapidly and the company expects to occupy it early in the spring.

**Uses Renold Chain**—The 1909 Lambert cars use a Renold silent chain for transmitting from the jackshaft to the rear axle, instead of a Morse silent chain as stated in a description of these cars recently published in Motor Age.

**Quits Carriage Business**—Considerable interest is attached to the announcement that the Hearsey-Willis Co., of Indianapolis, has arranged to retire from the carriage business. The company was established 25 years ago by H. T. Hearsey and for many years sold carriages exclusively, building up a large business in this line. The company claims the distinction of having sold the first motor car sold in Indianapolis, a Pope-Waverley electric, to C. E. Coffin, of the Central Trust Co. During the last 5 years it has attained a large motor car business and the building is being remodeled to accommodate motor cars and sundries exclusively in the future.

**New Carrico Board**—The Carrico Motor Co. held its annual meeting January 4. The following officers and seven directors were elected: O. E. Walker, president of the Queen City Forging Co., president. F. D. Carrico, formerly general manager of the Speed Changing Pulley Co. and designer of the Carrico air-cooled engines, vice-president and general manager; T. P. Walker, of the Queen City Forging Co., secretary; Charles S. Ferris, treasurer; R. E. LeBlond, of the R. E. LeBlond Machine Tool Co.; Edward Raber, of Raber Brothers, hardware merchants, and W. E. Krants, directors. The company is located on the third and fourth floors of the large building owner by Julius Uihlein & Co., at 208-214 Elm street, Cincinnati, pending the erection of a large plant which it intends to build. It will manufacture a full line of air and water-cooled engines.

NEW PENCE BUILDING, MINNEAPOLIS

**Adds a High-Wheeler**—The La Crosse Implement Co., one of the largest implement companies in the country, which a few weeks ago announced it will handle the Jackson line this year, has also taken on the Fuller, a high-wheeled proposition.

**Lear Stock Increased**—Stockholders of the Oscar Lear Automobile Co., of Springfield, decided at their last annual meeting to increase the capital stock of the concern from $200,000 to $250,000. The new issue will be preferred. The company has many orders on hand and the money from the additional stock will be used to increase the facilities and push the business. Toledo people are interested in the concern.

**Blake Quits Retail Trade**—E. P. Blake, veteran Jackson agent and New England distributer, has announced his retirement from the retail trade in Boston and in the future will devote his entire attention to the distributing of Jackson cars through his territory in the New England states. The agency at Boston will be taken up by Harry S. Merry, formerly traveling representative for the Maxwell-Briscoe company in Connecticut, Massachusetts and Rhode Island and proprietor of the Pittsfield Auto Garage at Pittsfield, Mass. Mr. Merry will move into the three-story building at 24 and 26 Tennyson street.

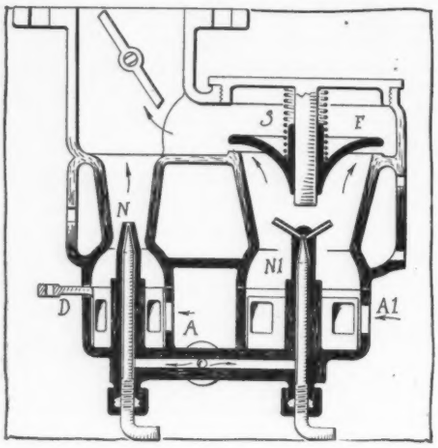
**Omaha Expects Big Show**—With the date for Omaha's third annual show, February 24 to 27, still nearly 5 weeks distant, the indications are that it will be bigger and better in every way than any preceding show held in that city. The entire floor space of the Auditorium, where the show will be held, has been allotted, principally to local dealers, and applications continue to come in from outside dealers and manufacturers. To care for these additional applicants the tiers of boxes on the main floor will be removed, and the stage in the rear utilized. This extra space, it is thought, will be ample to care for any exhibitor who is late in getting in his application.

**Pence's New Store**—The new store of the Pence Automobile Co., of Minneapolis, will be ready for occupancy about May 1. The frontage is 75 feet by 160 feet deep, eight stories and a basement. The first, or ground, floor will be the offices and show rooms; the second floor will be the garage; the third floor, stock rooms; fourth and fifth floors, storage; sixth floor, paint shop; seventh floor, metal, wood working, and top departments; eighth floor, machine and repair shop. The building will be constructed of reinforced concrete throughout and will have the most modern appliances and conveniences of every kind, including fast freight elevators, traveling 250 feet per minute. It will cost in the neighborhood of $150,000.

# Development Briefs

## WILLET CARBURETER

The Willet carbureter was referred to in Motor Age, but the accompanying illustration shows its construction to consist of two nozzles, N and N1, the former termed the low speed nozzle. In conjunction with the nozzle N is a throttle D, whereby the air supply entering at A is limited and a greater pull placed upon the air in the nozzle, the result being a richer mixture. The automatic valve F cuts in the second nozzle N1 and is held seated by a spring S surrounding the stem. This valve lifts as soon as the motor demand exceeds the possibilities of the smaller nozzle N. Both mixing chambers are waterjacketed and the air entrances A and A1 are protected by fine mesh brass screens.




WILLET CARBURETER

## MOON SELF-STARTER

A new Moon feature is a motor-starting apparatus which is used in connection with the Bosch high-tension magneto. By pressing the brass button of the device, which is on the dash, the motor may be started without the use of any other agency, except the magneto itself. The apparatus itself consists of a means of disengaging the magneto from the driving gear and spinning the armature of the magneto by the slight pressure of the foot. After one cylinder has been fired, an impetus is given to the crankshaft, and the magneto automatically drops in gear again.

## MARVEL INVENTS TIRE

L. D. Marvel, son of the late governor of Delaware, has invented and patented an improved tire which he claims will do away with the use of the pneumatic by the motorist, retaining at the same time all the resiliency of the air tire. Mr. Marvel's idea is the familiar spiral spring device, the springs, grouped in segments, being set between the rim and the outer tire. Damaged portions of the springs can easily be removed and new ones inserted, and it is claimed that the first cost and maintenance of the new tires is about half those of the pneumatic, while the saving in time in making repairs in case of accident is also claimed to be considerable. The inventor says that although he has received several flattering offers for his tire, he intends to manufacture and market it himself.

## FIREPROOF GARAGE DOOR

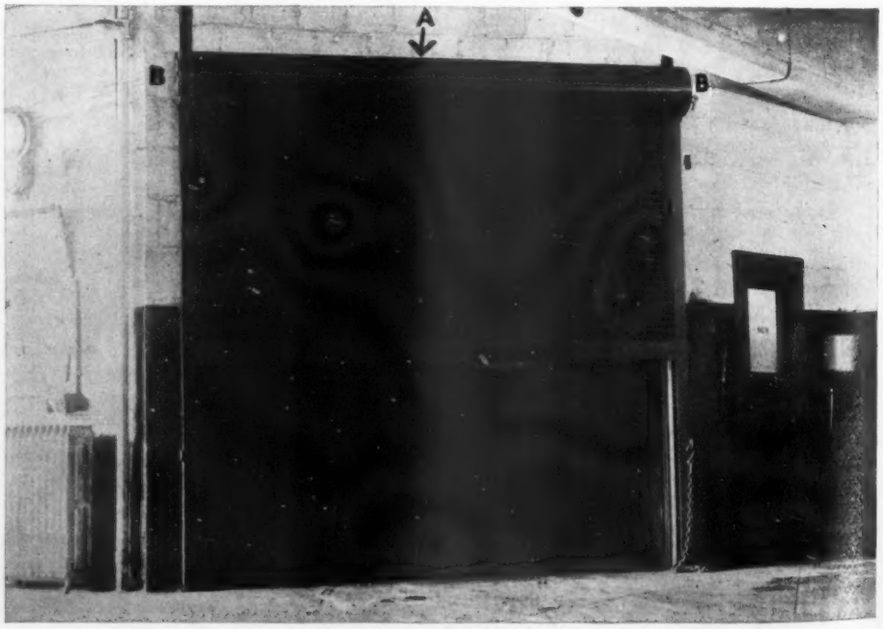
One of the garages in Boston that is really representative of up-to-date construction is the new fireproof structure erected by the White company. There are six floors and the construction is so thorough that were a fire to start on one floor it would burn itself out there. There is protection both from within and without. At each elevator well there is a steel shield which acts as a fireproof curtain and works automatically. At A there is some soft solder, and when there is any heat that is above the ordinary, this melts, releasing the clutches at B, and the door drops down into place quickly, thereby shutting off all connection between the floor and the elevator well. As it is through elevator shafts that a fire makes the greatest headway, the value of this to a garage filled with motor cars cannot be disputed. It does not take excessive heat to melt the solder, for if one were to light an ordinary match and hold it against the part for a few seconds the clutches are released. On each window there is a similar device, so the windows may close automatically.

## HANDY OIL-CARRIER

The Dover Stamping and Mfg. Co., Cambridge, Mass., has brought out a new dust-proof device for carrying extra oil and gasoline when touring. It is known as the New Dover Tourist oil and gasoline kit and consists of a black enamel steel case similar in appearance to a steel tool box, which may be quickly attached to, or detached from, the running board. It contains two enameled cans having a capacity of over 1½ gallons each, with special pouring spout and filler cap; and may be used for oil or gasoline or both, or one can may be removed and the space used for storage room. Those who tour much and who generally carry a supply of lubricants will appreciate this oil carrier. This idea also protects the tonneau through removing from the back end the oil supply generally carried there.

## NEW PIPE JOINT CEMENT

The H. W. Johns-Manville Co., of New York, has recently placed on the market what is know as H-O pipe joint cement. This cement is put up in powder form and it is claimed it does not dry out or deteriorate. In using it, the cement is mixed with either water or linseed oil, making it ready for use. The chemical properties of H-O cement are such that it expands after the joint is made up, thereby making a tight joint. It does not harden, it is said, and the joint made with it can be easily broken at any time without danger of breaking the fittings. The manufacturers claim that 1 pound of H-O cement, mixed with water, is equal to 4 pounds of the ready-mixed cement.




FIREPROOF GARAGE USED IN WHITE'S BOSTON BRANCH